MD110 Configuration Manual

EDACS® Jessica
PBX Gateway

ERICSSON

NOTICE!

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NOTICE!

Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

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1. INTRODUCTION

This manual contains configuration information for the Ericsson MD110 Private Branch Exchange (PBX) when used in the Jessica PBX Gateway. The configuration and installation of the MD110 are covered in detail in the Ericsson documentation. The MD110 installation should be performed by a certified MD110 technician. Ericsson Inc. provides configuration information and guidelines in this document, and also provides a sample or default MD110 configuration file. This default configuration file is for Jessica, but must be modified with customer-specific information. The MD110 is normally configured using FIOL, a PC-based on-line editing program provided by Ericsson with the MD110.

During the MD110 PBX installation, the MD110 must be programmed or configured with the customer-specific data collected in the Jessica MD110 configuration questionnaire shown in Appendix A. This questionnaire is intended to be used as a basis for defining the customer-specific MD110 configuration requirements. The questionnaire should be completed and provided to the installer of the MD110 at least two weeks in advance of the MD110 installation.

Section 2 contains information on interfaces and requirements, and Section 3 contains additional information and guidelines for the configuration of the MD110. Section 4 presents feature-specific MD110 programming. Section 5 provides information on the “standard” or default MD110 configuration. Sections 6 through 11 present additional information on other possible configurations. Basic knowledge of PBXs, and the MD110 in particular, is assumed.

This manual contains references to both T1 and E1 digital multiplexed interface standards. In some places the notation 23/30 is used; the 23 indicates the number of available T1 voice channels and the 30 indicates the number of available E1 voice channels. Jessica is not a local interconnect system associated with single-site EDACS. For information on local interconnect, refer to LBI-38513.

Additional information for Jessica can be found in the following publications:

- LBI-39000, EDACS Jessica PBX Gateway Systems Manual
- LBI-39001, EDACS Jessica PBX Gateway Operator's Manual
- LBI-39040, EDACS Jessica PBX Gateway PBX Interface User’s Manual
- LBI-39080, EDACS Jessica PBX Gateway Operator’s Manual (Quick Reference Guide)

For background information on the MD110 please refer to the following Ericsson MD110 documentation:

- LZY 203 5001/30, Electronic Manual for ASB 50104 (MD110)

The MD110 PBX is a subsystem of Jessica that provides analog or digital trunks to the public switched telephone network (PSTN) or to another PBX. Digital and analog telephone extensions can be connected to the MD110. A T1/E1 ISDN trunk, from the MD110 to the PBX Interface (PI), provides connection to EDACS. The direct inward system access (DISA) feature allows PSTN/PBX users to call the MD110, receive a second dial tone, enter an authorization code, and then dial a radio much like a PBX extension places an external call.

NOTE

To bypass the DISA Authorization Code, the customer must sign a waiver to obtain a software patch from Ericsson Inc. These arrangements can be made through an Ericsson Inc. sales representative. Please refer to the Software Requirements section (section 2.6).

EDACS radio-to-PSTN calls are direct inward dial (DID) calls into the MD110, which are routed to the PSTN. EDACS radio-to-PBX extension calls are DID calls into the MD110, which are connected to an MD110 extension. A Least-Cost Routing (LCR) code is normally used to direct calls out of the MD110 to the PSTN. The LCR code precedes the dialed number, such as the "9" typically used in North America to access an outside line. The LCR code is used by both radio and MD110 PBX users. LCR provides for routing based on the number dialed. It can modify numbers when necessary by inserting or deleting digits. It will wait for sufficient digits before passing them to a route, and will intercept invalid called numbers. In some cases, LCR will route manually entered digits from the PSTN callers that represent a radio ID. In many cases, External Destination codes are used instead of LCR codes to route calls to the PBX/PSTN.

Table 1 - EDACS Number Plan

00001-16382	LID	
20000-22047	GID	"2" prefix indicates GID
300001-316382	Digital LID	"3" prefix indicates digital
320000-322047	Digital GID	"3" prefix indicates digital "2" prefix indicates GID

On inbound calls, once the DISA dial tone is heard and an EDACS trunk selector has been entered, the EDACS number plan (Table 1) represents the actual number that the user must enter to reach a radio.

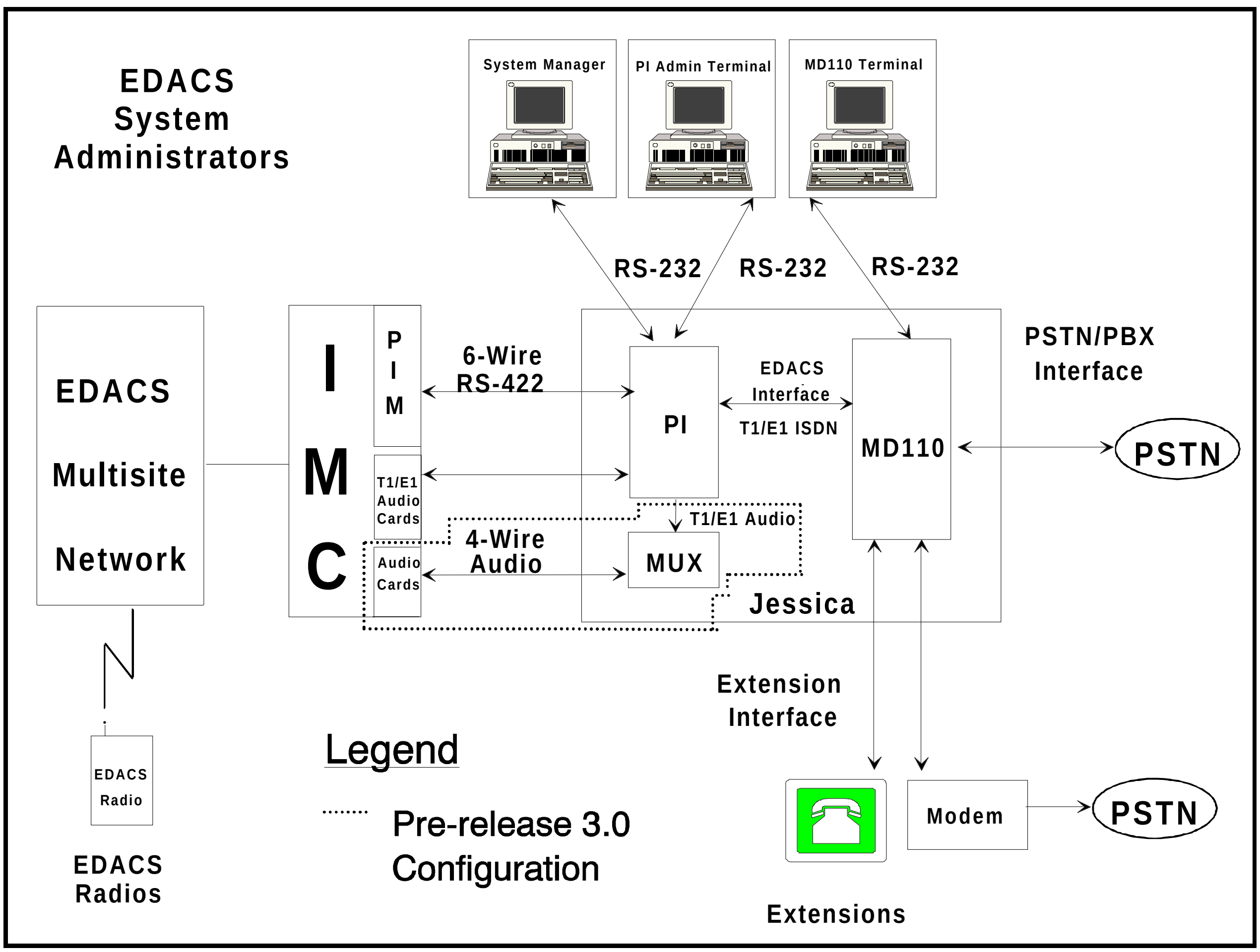


Figure 1 - MD110 Used in Jessica Application

2. INTERFACES AND REQUIREMENTS

2.1. EDACS INTERFACE

An EDACS-originated call appears to the MD110 as an incoming DID call from an external T1/E1 ISDN trunk. One external T1/E1 ISDN trunk is dedicated to EDACS; a TLU-77/1 (T1) or TLU-76/1 (E1) board in the MD110 provides the trunk interface. This allows up to 23/30 simultaneous calls to be handled.

- For calls to another PBX or to the PSTN, the number may begin with an LCR code or an external destination code. "9" is typically used to access an outside line.
- For calls to MD110 extensions, the number is the extension number.

2.2. PSTN/PBX INTERFACE

A PSTN-originated or PBX-originated call appears to the MD110 as an incoming trunk call. The PSTN interface can be analog or digital, and it can be a CO or DID trunk. The PBX interface can be an analog or digital tie trunk.

<u>Minimum Requirements for the PSTN/PBX Trunks</u>

- The ability to perform end-to-end tone signaling while in the connected state.
- The ability to properly send and receive call clearing signals.
- Direct inward dialing to radios requires trunks capable of passing dialed digits to the MD110.

Trunks or lines with forward and backward line clearing, and B-answer supervision are highly recommended. See the explanation below.

With Line Clearing	Without Line Clearing
When the Network hangs up, the interconnect call will clear and free interconnect and radio resources.	When the Network hangs up, the radio must clear the interconnect call or let it clear due to hang time expiration or conversation limit expiration to free interconnect and radio resources. This problem would be very significant for full duplex calls, since the user must clear the call or the call will clear only after the conversation limit expiration.

With B-Answer	Without B-Answer
• Radios will hear IMC-generated ringback for outbound calls.	• Radios will hear MD110 or Network ringback for outbound calls.
• Ringing duration on outbound calls will be limited to the OUTBOUND_ALERTING parameter limit in the CONFIG.DAT of the PI.	• Ringing duration on outbound calls will not be limited by the PI unless the phone-to-phone CONV_LIMIT parameter is applicable as in call forwarding scenarios.
• In applications where billing is performed, the option to bill the customer only if the called party answers exists.	• In applications where billing is performed, the customer will be billed for calls even if the called party does not answer.

T1 or E1 tie trunks are highly recommended for connecting the MD110 to another PBX.

Calls to EDACS require DISA access and the radio ID, and may require an LCR or EDACS trunk selector code. Calls to MD110 extensions require an extension number.

2.3. EXTENSION INTERFACE

An extension-originated call appears to the MD110 as a local extension call. This interface can be analog or digital.

Call requirements are as follows:

- Calls to EDACS may require an LCR or EDACS selector code followed by the radio ID.
- Calls to the PSTN typically require an LCR code followed by the PSTN number.
- Calls to another PBX may require an LCR code or an external destination code.
- Calls to MD110 extensions require an extension number.

2.4. SYSTEM ADMINISTRATOR INTERFACE

The system administrator interface is an RS-232 serial communication port; the PC or terminal can configure, test, troubleshoot, and monitor alarm conditions in the MD110.

Ericsson's standard PC-based communications software is FIOL. It is a DOS-based program included with PC Softdisk (PCSD) software. PCSD is an Ericsson MD110 file structure emulator for a PC. It allows the MD110 to utilize a PC's hard drive through a small computer systems interface (SCSI). PCSD may also be used to boot the MD110 should its internal hard drive fail.

2.5. HARDWARE REQUIREMENTS

The MD110 requires a minimum hardware configuration, which is modified according to customer requirements. The MD110 is ordered by defining the number and type of trunks, extensions, etc. The Jessica MD110 requires one ISDN trunk interface for connecting to the PI. The customer determines the PSTN or other PBX interface requirements, and voice/data extension requirements. The following configuration is for an MD110 mode /50, less PSTN/PBX trunk interfaces.

2.5.1. Minimum Order Contents

The contents of the basic MD110 order is minimally as follows:

Item	Quantity	Description
LPU-5	1	LIM Processor Unit
LSU/4	1	LIM Switch Unit
DSU/4	3	Distributed Switch Unit
TMU	1	Tone Sender Unit
TMU	1	Tone Receiver Unit
REU	1	Ringing Equipment Unit
IPU	1	Input Unit
HDU3	1	Hard Drive Unit
SCU	1	SCSI Controller Unit for external PC
TLU-77/1 or TLU-76/1	1	T1/E1 ISDN Trunk Board
ELU29	1	Extension Line Unit

Item	Quantity	Description
ALU-2	1	Alarm Unit
SIU	1	Serial Interface Unit
R1A	2	Serial Filter Unit for IPU and SIU
PU4DC	3	Power Unit
Rectifier and Power Converters	1	Set of items
Battery Backup	1	Lead acid batteries
System Specification	1	LIM HW and SW configuration
Basic Customer Library	1	Documentation
MD110 Technician Training	1	Provided by EBC
Software Support Contract	1	Provided by EBC

An Ericsson dial-back modem is also needed for remote configuration.

2.5.2. Redundancy/Fault Tolerance

Since the MD110 provides a redundant control system option, the following could be added for increased reliability:

Item	Quantity	Description
LPU-5	1	LIM Processor Unit
LSU/4	1	LIM Switch Unit
DSU/4	3	Distributed Switch Unit

2.5.3. Application-Specific Hardware

Items are added based on requirements for the PSTN/PBX trunks, SMDR (call information logging reports), voice mail, operators, etc. The MD110 Technical Product Description contains information on the many possibilities.

2.6. SOFTWARE REQUIREMENTS

The MD110 requires the use of BC 8.0 software or later. This software includes the country-specific program units that are provided when ordered for the appropriate country. PC Softdisk software is required for external system backup and software updates. An alternative to PC Softdisk is a second hard drive unit (HDU) which is used for software backup, but it does not provide for software updates. There are two patches to the basic software that pertain to Jessica.

Item	Quantity	Description
BC 8.0A.CNI51	1	LIM system software.
PCSD	1	PC Softdisk software for the external PC. This includes FIOL for MD110 configuration.
Patch 34180	1	EZDISA - eliminates Authorization Code requirement for inbound interconnect calls.
Patch 34745	1	Necessary if T1 Bothway Ground Start trunks are used for inbound interconnect calls.

In addition, the MD110 must be programmed or configured with a customer-specific database. A configuration file needs to be constructed for properly configuring the MD110 for the specific customer application. The remaining sections of this manual provide additional information on MD110 configuration.

3. CONFIGURATION

This section covers configuration considerations and preparations which must be completed prior to installing the Jessica PBX Gateway equipment.

3.1. EDACS JESSICA EXTERNAL INTERFACE CONFIGURATION DEFINITION

Jessica interfaces with the PSTN or PBX switching equipment through several configurations: directly to the PSTN, directly to the customer PBX, or directly to the PSTN and the customer PBX. These interface configurations are shown below.

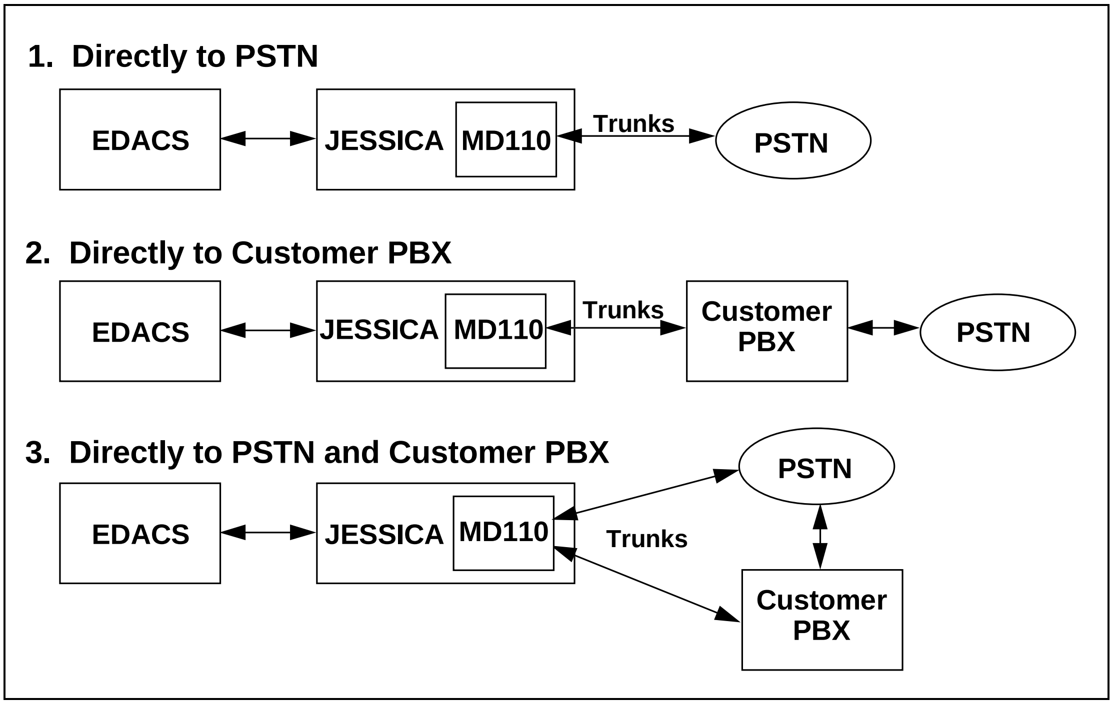


Figure 2 - Jessica PBX Gateway Configurations

3.2. NUMBER OF TELEPHONE INTERCONNECT AUDIO CHANNELS/LINES

Either a T1 or an E1 ISDN trunk is used to provide the Jessica internal interface connection between the PI and the MD110. The type of digital trunk to be used depends on the digital interface standards followed by the country of installation. Use of a T1 line allows up to a maximum of 23 simultaneous interconnect calls to be handled by Jessica. Use of an E1 line allows up to a maximum of 30 simultaneous interconnect calls to be handled by Jessica. The number of audio channels provided between the IMC and Jessica, and the number of termination lines provided between Jessica and the external switching equipment must be sized with the limitation above in mind. Consideration must also be given to maintaining an equal balance between the number of audio channels and termination lines provided. It is highly recommended that an equal number of audio channels (between the IMC and Jessica) and termination lines (between Jessica and the external switching equipment) be used. Failure to implement a balanced configuration may result in interconnect call blocking within Jessica.

3.2.1. Audio Channels Between the IMC and Jessica

The number of audio channels between the IMC and Jessica must be less than or equal to 23/30 (T1/E1). Audio channels are available in increments of 4 channels (4 audio channels per IMC PIM audio board) up to the maximum allowed.

3.3. TRUNK LINE CONNECTIONS AND CHARACTERISTICS

A variety of trunk line connections may be used to connect the Jessica MD110 and the external switching equipment. The MD110 supports the following types of analog and digital trunk line connections for both E1 and T1:

- CO Trunk - the most common variety of trunk used to interconnect to/from the PSTN
  - supports bothway traffic
- DID Trunk - special type of CO trunk used to interconnect from PSTN
  - supports only inbound traffic
  - used for direct inward dialing of an EDACS radio; overdialing of radio is not required
- TIE Trunk - used to interconnect to/from another PBX
  - supports bothway traffic

The MD110 supports the following trunk line characteristics:

- Loop Start - commonly used with PBX systems
  - problems occur when used to carry bothway traffic. The trunk can be seized in both directions at once and the calls collide. The MD110 questionnaire recommends that loop start trunks be converted to ground start.
- Ground Start - minimizes call collision
  - preferred type of trunk

Figure 3 shows an example of trunk line configurations used to connect Jessica to the external switching equipment.

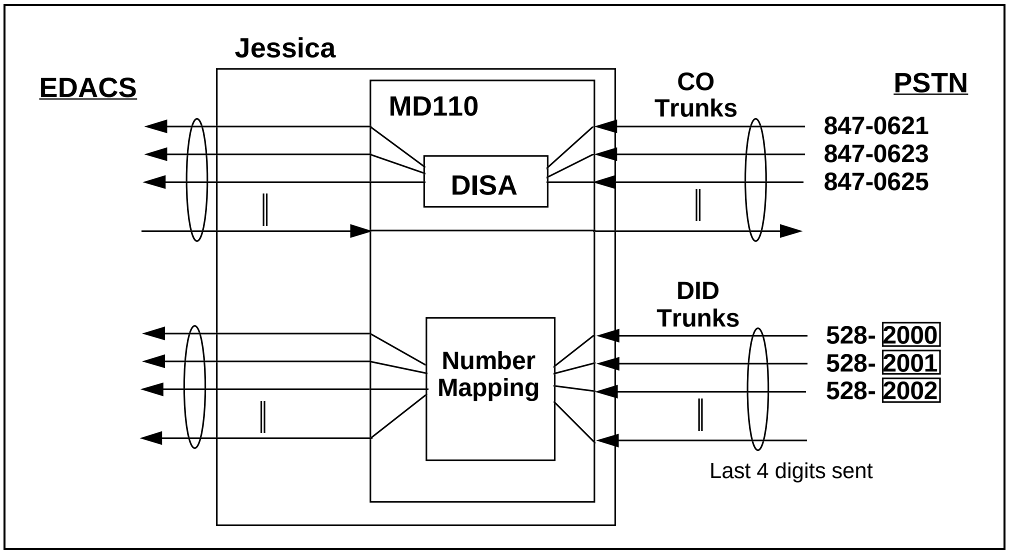


Figure 3 - Example Jessica Trunk Line Configurations

3.4. MD110 CONFIGURATION DEFINITION

The MD110 configuration must be defined for each customer’s specific requirements. Advance planning and coordination with Ericsson Business Network (EBN) is required before an MD110 installation. The MD110 installation is performed by EBN or other in-country Ericsson sales office. Ericsson Inc. is responsible for working with the customer to provide MD110 configuration definition. This is performed by completing the MD110 configuration questionnaire contained in Appendix A two weeks before the MD110 installation. Several areas that must be defined are listed below.

- Specification of trunk line connections
- Definition of trunk characteristics
- Definition of MD110 numbering plan
- Specification of least-cost routing requirements
- Identification of toll call restrictions

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4. FEATURE-SPECIFIC MD110 PROGRAMMING

4.1. SITE-BASED CALL ROUTING

Outbound calls can be routed based on the originating radio site. The MD110 and the PI both control portions of site-based call routing. The PI controls site-based call routing via a new configuration parameter (SITE_ROUTING_ENABLE, which is enabled when set to TRUE), but the MD110 performs the actual call routing.

The MD110 can use up to five digits of the incoming number to determine call routing. Three of these digits are prepended by the PI (1 to indicate the routing tables and 2 to indicate the originating site). Two digits of the incoming number are analyzed. Outbound calls contain information about the originating EDACS site. The PI prepends a user-defined routing digit (0-9) (SITE_ROUTING_PREFIX parameter defined in CONFIG.DAT -- default of 6) followed by a 2-digit originating EDACS site ID (01-32).

The MD110 removes the prepended digits and routes the call to the appropriate trunk using Route Destination Codes (DEST). There are limitations in the MD110 as to how discriminating the routing based on the called number can be since the tables used were designed for one or a few codes, and are now divided for 32 sites. The DEST routing table can support 500 entries. The following figure is an example of the site-based routing codes for a two-site system (site 1 and site 2) where

Site 1		**Site 2**	
Call Type	**Trunk routed to**	**Call Type**	**Trunk routed to**
Local 7-digit	Digital= ROU=11	Local 7-digit	Analog=ROU=12
Long Distance (1+)	Analog=ROU=12	Long Distance (1+)	Digital=ROU=11
Operator Assisted (0+)	Digital=ROU=11	Operator Assisted (0+)	Analog=ROU=12

NOTE

The MD110 configuration work for routing based on the site of origination and the dialed number is performed as part of the installation by Applications Engineering.

Call routing out a trunk can be verified by the CTDEI command at the MD110's FIOL interface. An example of the use of this command is presented below.

<u>CTDEI Command -- Call To Route Verification</u>

<u>For Route 11 -- (Digital T1 Bothway Trunk)</u>

```
CTDEI:EQU=1-0-40-2;
CTDEI:EQU=1-0-40-3;
CTDEI:EQU=1-0-40-4;
CTDEI:EQU=1-0-40-5;
```

A call sent out this route (determined by site-based routing code) will be perceived on one of these ports as an equipment connection.

```
/****************************************************/
/*SITE-BASED ROUTING                               */
/*ROUTING CODES ARE EXTERNAL DESTINATION CODES     */
/*THAT HAVE THE SITE ID PREPENDED WITH THE NUMBER 5*/
/*SITE_ROUTING_PREFIX = 5                          */
/****************************************************/
NANSI:NUMTYP=ED,NUMSE=5010&&5029;@/EXEC/
NACDS:NUM=1,CDCAT=0&1;@/EXEC/
NACDS:NUM=8,CDCAT=0&1&2;@/EXEC/
RODDI:DEST=5010,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5011,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5012,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5013,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5014,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5015,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5016,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5017,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5018,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5019,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5020,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5021,ROU=11,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5022,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5023,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5024,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5025,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5026,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5027,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5028,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
RODDI:DEST=5029,ROU=12,ADC=0005000000000250,SRT=4;@/EXEC/
/**************************************/
/*OPERATOR-ASSISTED LONG DISTANCE 501 */
/**************************************/
NANLS:EXL=501010,MIN=14,MAX=14;
NANLS:EXL=501011,MIN=14,MAX=14;
NANLS:EXL=501020,MIN=14,MAX=14;
NANLS:EXL=501021,MIN=14,MAX=14;
NANLS:EXL=501030,MIN=14,MAX=14;
NANLS:EXL=501031,MIN=14,MAX=14;
NANLS:EXL=501040,MIN=14,MAX=14;
NANLS:EXL=501041,MIN=14,MAX=14;
NANLS:EXL=501050,MIN=14,MAX=14;
NANLS:EXL=501051,MIN=14,MAX=14;
NANLS:EXL=501060,MIN=14,MAX=14;
NANLS:EXL=501061,MIN=14,MAX=14;
NANLS:EXL=501070,MIN=14,MAX=14;
NANLS:EXL=501071,MIN=14,MAX=14;
NANLS:EXL=501080,MIN=14,MAX=14;
NANLS:EXL=501081,MIN=14,MAX=14;
NANLS:EXL=501090,MIN=14,MAX=14;
NANLS:EXL=501091,MIN=14,MAX=14;
```

Figure 4 - Site-Based Routing Codes

```
/**************************************/
/*OPERATOR-ASSISTED LOCAL   501       */
/**************************************/
NANLS:EXL=501023,MIN=11,MAX=11;
NANLS:EXL=501038,MIN=11,MAX=11;
NANLS:EXL=501052,MIN=11,MAX=11;
NANLS:EXL=501053,MIN=11,MAX=11;
NANLS:EXL=501058,MIN=11,MAX=11;
NANLS:EXL=501066,MIN=11,MAX=11;
NANLS:EXL=501082,MIN=11,MAX=11;
NANLS:EXL=501083,MIN=11,MAX=11;
NANLS:EXL=501084,MIN=11,MAX=11;
NANLS:EXL=501092,MIN=11,MAX=11;
NANLS:EXL=501094,MIN=11,MAX=11;
NANLS:EXL=501087,MIN=11,MAX=11;
NANLS:EXL=501029,MIN=11,MAX=11;
NANLS:EXL=501099,MIN=11,MAX=11;
/**************************************/
/*LONG DISTANCE   501                 */
/**************************************/
NANLS:EXL=5011,MIN=14,MAX=14;
/**************************************/
/*         LOCAL   501                */
/**************************************/
NANLS:EXL=5012,MIN=10,MAX=10;
NANLS:EXL=5013,MIN=10,MAX=10;
NANLS:EXL=5014,MIN=10,MAX=10;
NANLS:EXL=5015,MIN=10,MAX=10;
NANLS:EXL=5016,MIN=10,MAX=10;
NANLS:EXL=5017,MIN=10,MAX=10;
NANLS:EXL=5018,MIN=10,MAX=10;
NANLS:EXL=5019,MIN=10,MAX=10;
```

Figure 4 - Site-Based Routing Codes (Cont.)

```
/**************************************/
/*OPERATOR-ASSISTED LONG DISTANCE 502 */
/**************************************/
NANLS:EXL=502010,MIN=14,MAX=14;
NANLS:EXL=502011,MIN=14,MAX=14;
NANLS:EXL=502020,MIN=14,MAX=14;
NANLS:EXL=502021,MIN=14,MAX=14;
NANLS:EXL=502030,MIN=14,MAX=14;
NANLS:EXL=502031,MIN=14,MAX=14;
NANLS:EXL=502040,MIN=14,MAX=14;
NANLS:EXL=502041,MIN=14,MAX=14;
NANLS:EXL=502050,MIN=14,MAX=14;
NANLS:EXL=502051,MIN=14,MAX=14;
NANLS:EXL=502060,MIN=14,MAX=14;
NANLS:EXL=502061,MIN=14,MAX=14;
NANLS:EXL=502070,MIN=14,MAX=14;
NANLS:EXL=502071,MIN=14,MAX=14;
NANLS:EXL=502080,MIN=14,MAX=14;
NANLS:EXL=502081,MIN=14,MAX=14;
NANLS:EXL=502090,MIN=14,MAX=14;
NANLS:EXL=502091,MIN=14,MAX=14;
/**************************************/
/*OPERATOR-ASSISTED LOCAL   502       */
/**************************************/
NANLS:EXL=502023,MIN=11,MAX=11;
NANLS:EXL=502038,MIN=11,MAX=11;
NANLS:EXL=502052,MIN=11,MAX=11;
NANLS:EXL=502053,MIN=11,MAX=11;
NANLS:EXL=502058,MIN=11,MAX=11;
NANLS:EXL=502066,MIN=11,MAX=11;
NANLS:EXL=502082,MIN=11,MAX=11;
NANLS:EXL=502083,MIN=11,MAX=11;
NANLS:EXL=502084,MIN=11,MAX=11;
NANLS:EXL=502092,MIN=11,MAX=11;
NANLS:EXL=502094,MIN=11,MAX=11;
NANLS:EXL=502087,MIN=11,MAX=11;
NANLS:EXL=502029,MIN=11,MAX=11;
NANLS:EXL=502099,MIN=11,MAX=11;
```

Figure 4 - Site-Based Routing Codes (Cont.)

```
/***************************************/
/*LONG DISTANCE   502                 */
/***************************************/
NANLS:EXL=5021,MIN=14,MAX=14;
/***************************************/
/*          LOCAL   502               */
/***************************************/
NANLS:EXL=5022,MIN=10,MAX=10;
NANLS:EXL=5023,MIN=10,MAX=10;
NANLS:EXL=5024,MIN=10,MAX=10;
NANLS:EXL=5025,MIN=10,MAX=10;
NANLS:EXL=5026,MIN=10,MAX=10;
NANLS:EXL=5027,MIN=10,MAX=10;
NANLS:EXL=5028,MIN=10,MAX=10;
NANLS:EXL=5029,MIN=10,MAX=10;
```

Figure 4 - Site-Based Routing Codes (Cont.)

For Route 12 -- (Analog Bothway Trunk)

CTDEI:EQU=1-2-63-0;
CTDEI:EQU=1-2-63-1;
CTDEI:EQU=1-2-63-2;
CTDEI:EQU=1-2-63-3;

A call sent out this route (determined by site-based routing code) will be perceived on one of these ports as an equipment connection.

4.2. ENABLING INBOUND DIGITS FROM MD110 EXTENSIONS

NOTE

For the PI to display an external caller's number, the Central Office must send the caller's number to the MD110.

To enable inbound digits from MD110 extensions and thus allow radios to display the caller's (MD110 extension) number, the ADC parameter of the extensions must appear as follows:

EXTEI: DIR=XXXX&&XXXX, CAT=0, EQU=1-X-XX-0, TYPE=EL6, TRM=0, ICAT=0000, **ADC=000000001**

The 9th bit must be set to a "1" which allows the extension's directory number to be sent through the public network. If the ADC parameter is already set to "0" on the 9th bit, use the EXCAC command as follows to set the bit to "1": EXCAC: DIR=XXXX, ADC=000000001.

This programming is needed for the phone field to be displayed in the ***snap*** command and the Call Activity Records (refer to LBI-39040).

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5. ADMINISTRATION AND EXAMPLE PROGRAMMING

This section is intended to outline the items needing consideration when configuring an MD110 and is not intended to be all-inclusive. The MD110 manual set is composed of several volumes and could not be adequately compressed here. This Jessica configuration provides telephone interconnect between EDACS and the PSTN. It includes a minimum number of analog extensions for testing. If the customer requires connection of Jessica to another PBX, or wishes to use the MD110 as the business PBX, this configuration may be significantly altered and may require the assistance of an MD110 qualified systems engineer. Pointers for customizing the MD110 for these cases are herein.

5.1. ADMINISTRATION SUGGESTIONS

The following organization is used for the Public Network configuration and the PBX Network configuration described in sections 6 and 7, respectively. The rationale is to make the Trunk Call Discrimination (TCD), Traffic Matrix Group (TMG), and Common Abbreviated Dialing (CAD) categories the same number for particular groups in the system. This simplifies the MD110 administrator's task. These are explained in detail later along with the Route and LCR choices.

TCD, TMG, and CAD CATEGORY

	TCD	TMG	CAD
Extensions	0	0	0
EDACS Routes	1	1	1
Private Network Routes	2	2	2
Public Network Routes	3	3	3

NOTE

- Assigning entries to TCD or TMG Category 15 allows maximum privileges, which can result in telephone fraud.
- If any extension groups with different calling privileges are added, it is recommended that their TCD or TMG category should begin at 5 and use 6, 7, 8, ...
- If any additional EDACS, Private Network, or Public Network Routes (trunk groups) with different calling privileges are added, begin at 14 and use 13, 12, 11, ...
- It is unlikely that many of these options will be added, and minimizing the number of these categories will simplify the MD110 administrator's task.
- CAD only contains 4 classes

ROUTES

	Route Number	External Destination Code
EDACS	10-19	670-679
Private Network	20-29	680-689
Public Network	30-39	690-699

LCR

	Number
EDACS	7
Private Network	8
Public Network	9

Please refer to Table 1 for the EDACS number plan.

5.2. SCRIPT FILE

NOTE

The following script file is meant to be a basis for configuring the MD110. This script file must be customized for your application (by adding board IDs, for example). FIOL can send a completed script file to a LIM with a clean software load (no configuration).

After the file is sent and a dump (save) to the MD110's Hard Drive Unit (HDU) is performed, the script file can not be used to change the configuration. If the dump has not been performed, a power cycle of the MD110 will clear the configuration from RAM and another updated script file can be sent.

Once the MD110 configuration has been dumped (saved), MD110 commands must be entered to end (erase) configuration information and initiate (enter) configuration. These commands are order-sensitive and require the use of the MD110 Operation and Maintenance ACS, MD110 Operation and Maintenance SES, Documents for Applications Systems "Whatever Country," and Least-Cost Routing manuals.

Configuring the MD110 is not recommended for someone with no PBX configuration experience or MD110 training. The recommended training includes an MD110 Introduction, Extension Programming, Trunk Programming, and Traffic Management courses. Ericsson provides condensed manuals to attendees of these training courses.

In the script file below, lines requiring user editing are in bold.

```
/*****************************************************************************/
/*    Description:      JESSICA MD110 Configuration Script File              */
/*    File Name:        JESS_MD.TXT                                          */
/*    Version:          0.02                                                 */
/*    Date:             10-December-93                                       */
/*****************************************************************************/

/*****************************************************************************/
/*    NUMBER ANALYSIS                                                        */
/*****************************************************************************/
/*****************************************************************************/
/*    Least Cost Routing                                                     */
/*****************************************************************************/
NANSI:NUMTYP=LC, NUMSE=9;

/*****************************************************************************/
/*    External Destination                                                   */
/*****************************************************************************/
NANSI:NUMTYP=ED, NUMSE=0&&3&670&&699;
```

```
/*********************************************************************************/
/*     DISA                                                                    */
/*********************************************************************************/
NANSI:NUMTYP=DI, NUMSE=5000;

/*********************************************************************************/
/*     Extensions                                                              */
/*********************************************************************************/
NANSI:NUMTYP=EX, NUMSE=4000&&4099;

/*********************************************************************************/
/*     Common Abbreviated Dialing                                              */
/*********************************************************************************/
NANSI:NUMTYP=AC, NUMSE=4100&&4999;

/*********************************************************************************/
/*     Number Analysis TCD                                                     */
/*********************************************************************************/
NACDS:NUM=0,CDCAT=0&2&3;
NACDS:NUM=1,CDCAT=0&2&3;
NACDS:NUM=2,CDCAT=0&2&3;
NACDS:NUM=3,CDCAT=0&2&3;
NACDS:NUM=4,CDCAT=0&1&2&3;
NACDS:NUM=500,CDCAT=2&3;
NACDS:NUM=9,CDCAT=0&1;

/*********************************************************************************/
/*     Number Analysis External Number Length                                  */
/*********************************************************************************/
NANLS:EXL=0,MIN=5,MAX=5;
NANLS:EXL=1,MIN=5,MAX=5;
NANLS:EXL=2,MIN=5,MAX=5;
NANLS:EXL=3,MIN=6,MAX=6;
NANLS:EXL=690911,MIN=6,MAX=6;


/*********************************************************************************/
/*     TRAFFIC MATRIX                                                          */
/*********************************************************************************/
/*********************************************************************************/
/*     Traffic                                                                 */
/*********************************************************************************/
TCMAS:CON=T,A=0,B=0&1&2&3;
TCMAS:CON=T,A=1,B=0&2&3;
TCMAS:CON=T,A=2,B=0&1;
TCMAS:CON=T,A=3,B=0&1;
```

```
/******************************************************************************/
/*    Conference                                                              */
/******************************************************************************/
TCMAS:CON=C,A=0,B=0&1&2&3;
TCMAS:CON=C,A=1,B=0&2&3;
TCMAS:CON=C,A=2,B=0&1;
TCMAS:CON=C,A=3,B=0&1;


/******************************************************************************/
/*    PUBLIC NETWORK LCR                                                      */
/******************************************************************************/
/******************************************************************************/
/*    Public Network LCR ENT Table                                            */
/******************************************************************************/
LCDDI:TAB=ENT,ENTRY=911,PRE=690,CONF=N;
LCDDI:TAB=ENT,ENTRY=9911,TRC=1,PRE=690,CONF=N;

/******************************************************************************/
/*    Public Network LCR NLT Table                                            */
/******************************************************************************/

/******************************************************************************/
/*    Public Network LCR FDT Table                                            */
/******************************************************************************/
LCDDI:TAB=FDT,FRCT=30,PRE=690,TZONE=1;

/******************************************************************************/
/*    Public Network LCR DNT1 Table                                           */
/******************************************************************************/

/******************************************************************************/
/*    Public Network LCR DNT2 Table                                           */
/******************************************************************************/

/******************************************************************************/
/*    LCR Default Routing                                                     */
/******************************************************************************/
LCLDI:LIM=1,AC=XXX,DEST=690;


/******************************************************************************/
/*    ANALOG EXTENSIONS                                                       */
/******************************************************************************/
/******************************************************************************/
/*    Common Class of Service Categories                                      */
/******************************************************************************/
EXCCS:CAT=0,TRAF=00000000,SERV=00021207,CDIV=000000000,ROC=0230;
```

```
/*********************************************************************************/
/*     Analog Extension Equipment                                                */
/*********************************************************************************/
EXTEI:DIR=4001&&4008,CAT=0,EQU=1-X-XX-0,TYPE=EL6,TRM=0,ICAT=0000,ADC=000000000;


/*********************************************************************************/
/*     COMMON ABBREVIATED DIALING                                                */
/*********************************************************************************/
/*********************************************************************************/
/*     Extensions & EDACS to Public Network                                      */
/*********************************************************************************/
ADCOI:ABB=4XXX,TRA=9XXXX,CLASS=0&1;

/*********************************************************************************/
/*     Extensions & Public Network to EDACS                                      */
/*********************************************************************************/
ADCOI:ABB=4XXX,TRA=XXXXX,CLASS=0&3;


/*********************************************************************************/
/*     AUTHORIZATION CODE                                                        */
/*********************************************************************************/
AUCOI:AUTH=XXXX,CILCOD=XXXX,CAT=XX,CHECK=NO;


/*********************************************************************************/
/*     PI-MD110 ISDN ROUTE T1                                                    */
/*********************************************************************************/
/*********************************************************************************/
/*     Class                                                                     */
/*********************************************************************************/
ROCAI:ROU=10,SEL=011000010000,TRM=7,SERV=3100030010,TRAF=01010101,SIG=111110100031,
BCAP=11111;

/*********************************************************************************/
/*     Data                                                                      */
/*********************************************************************************/
RODAI:ROU=10,TYPE=SL63,VARC=00000000,VARI=00000003,VARO=000000B7;

/*********************************************************************************/
/*     Equipment                                                                 */
/*********************************************************************************/
ROEQI:ROU=10,TRU=1-1&&1-23,EQU=1-X-XX-0,INDDAT=000000000000;
```

```
/*********************************************************************************/
/*    External Destination Code                                                  */
/*********************************************************************************/
RODDI:DEST=0,ROU=10,ADC=1005000000000250,SRT=1;
RODDI:DEST=1,ROU=10,ADC=1005000000000250,SRT=1;
RODDI:DEST=2,ROU=10,ADC=1005000000000250,SRT=1;
RODDI:DEST=3,ROU=10,ADC=1005000000000250,SRT=1;


/*********************************************************************************/
/*    PI-MD110 ISDN ROUTE E1 ECMA/ETSI                                           */
/*********************************************************************************/
/*********************************************************************************/
/*    Class                                                                      */
/*********************************************************************************/
ROCAI:ROU=10,SEL=011000010000,TRM=7,SERV=3100030010,TRAF=01010101,SIG=111110100031,
BCAP=11111;

/*********************************************************************************/
/*    Data                                                                       */
/*********************************************************************************/
RODAI:ROU=10,TYPE=SL60,VARC=00000000,VARI=00000000,VARO=003F0000;

/*********************************************************************************/
/*    Equipment                                                                  */
/*********************************************************************************/
ROEQI:ROU=10,TRU=1-1&&1-15,EQU=1-X-XX-1;
ROEQI:ROU=10,TRU=1-16&&1-30,EQU=1-X-XX-17;

/*********************************************************************************/
/*     External Destination Code                                                 */
/*********************************************************************************/
RODDI:DEST=0,ROU=10,ADC=1005000000000250,SRT=1;
RODDI:DEST=1,ROU=10,ADC=1005000000000250,SRT=1;
RODDI:DEST=2,ROU=10,ADC=1005000000000250,SRT=1;
RODDI:DEST=3,ROU=10,ADC=1005000000000250,SRT=1;


/*********************************************************************************/
/*    Public Network T1 DID Trunk without B-answer supervision                   */
/*    NORTH AMERICA                                                              */
/*********************************************************************************/
/*********************************************************************************/
/*    Class                                                                      */
/*********************************************************************************/
ROCAI:ROU=3X,SEL=010000010000,TRM=7,SERV=3000030100,TRAF=03030303,SIG=011010000000,
BCAP=00110;
```

```
/*****************************************************************************/
/*    Data                                                                   */
/*****************************************************************************/
RODAI:ROU=3X,TYPE=TL45,VARC=00000001,VARI=00000006;

/*****************************************************************************/
/*    Equipment                                                              */
/*****************************************************************************/
ROEQI:ROU=3X,TRU=1-1&1-X,EQU=1-X-XX-X,INDDAT=00000000000E;


/*****************************************************************************/
/*    Public Network T1 Bothway Ground Start Trunk without B-answer          */
/*    NORTH AMERICA                                                          */
/*****************************************************************************/
/*****************************************************************************/
/*    Class                                                                  */
/*****************************************************************************/
ROCAI:ROU=3X,SEL=011000010000,TRM=7,SERV=3100030100,TRAF=03030303,SIG=111010000000,
BCAP=00110;

/*****************************************************************************/
/*    Data                                                                   */
/*****************************************************************************/
RODAI:ROU=3X,TYPE=TL45,VARC=00000002,VARI=00000006,VARO=00000003;

/*****************************************************************************/
/*    Equipment                                                              */
/*****************************************************************************/
ROEQI:ROU=3X,TRU=1-1&&1-X,EQU=1-X-XX-X,INDDAT=00000000000E;

/*****************************************************************************/
/*    External Destination Code                                              */
/*****************************************************************************/
RODDI:DEST=690,ROU=3X,ADC=0005000000000250,SRT=4;

/*****************************************************************************/
/*    Inbound Call Routing                                                   */
/*****************************************************************************/
RODNI:ROU=3X,DAY=5000,NIG=5000;


/*****************************************************************************/
/*    Public Network Analog CO Trunks without B-answer                       */
/*    NORTH AMERICA                                                          */
/*****************************************************************************/
/*****************************************************************************/
/*    Class                                                                  */
/*****************************************************************************/
ROCAI:ROU=3X,SEL=011000010000,TRM=6,SERV=3100030100,TRAF=03030303,SIG=111010000000,
BCAP=00110;
```

```
/*************************************************************************************/
/*    Data                                                                          */
/*************************************************************************************/
RODAI:ROU=3X,TYPE=TL1,VARC=00000006,VARI=00000002,VARO=0000000D;

/*************************************************************************************/
/*    Equipment                                                                     */
/*************************************************************************************/
ROEQI:ROU=3X,TRU=1-1&&1-X,EQU=1-X-XX-0;

/*************************************************************************************/
/*    External Destination Code                                                     */
/*************************************************************************************/
RODDI:DEST=690,ROU=3X,ADC=0005000000000250,SRT=4;

/*************************************************************************************/
/*    Inbound Call Routing                                                          */
/*************************************************************************************/
RODNI:ROU=3X,DAY=5000,NIG=5000;
```

5.3. NUMBER ANALYSIS

The NANSI command reserves a number series within the MD110.

5.3.1. Least-Cost Routing Code

The LCR code for calls to the PSTN is typically defined as “9” in the MD110.

- Outbound radio calls prefix the Public Network number with this digit.
- MD110 extension calls to the Public Network prefix the Public Network number with this digit.

NANSI

NUMTYP	LC	Least-Cost Routing Code
NUMSE	9	

5.3.2. External Destination Code

External destination codes are defined in the MD110.

NANSI

NUMTYP	EX	External Destination Code
NUMSE	0&&3& 670&&699	0-3 route calls to EDACS. 670-699 are used by LCR for EDACS, Private Network, or Public Network call routing.

5.3.3. Direct Inward System Access Code (DISA)

The Direct Inward System Access (DISA) feature allows Public Network users to call the MD110 with a common public number, receive a second dial tone, and dial an EDACS radio.

DISA requires analog end-to-end signaling from the caller and across the Public Network. The trunks or lines connecting to DISA should provide line clearing. (Please refer to section 2.2 for a discussion of line clearing.)

NANSI

NUMTYP	DI	Direct Inward System Access
NUMSE	5000	

5.3.4. Extension Numbers

Extension numbers are defined as the range from 4000 to 4099.

NANSI

NUMTYP	EX	Extension
NUMSE	4000&&4099	Numbers 4000-4099 are for extension use

5.3.5. Common Abbreviated Dialing

Common Abbreviated Dialing (CAD) numbers are defined as the range from 4100 to 4999.

NANSI

NUMTYP	AC	Abbreviated Calling
NUMSE	4100&&4999	Numbers 4100-4999 are for CAD use

5.3.6. TCD Category

TCD CATEGORY

Extensions	0
EDACS Routes	1
Private Network Routes	2
Public Network Routes	3

See Table 1 for the EDACS number plan.

These entries allow TCD Categories to dial certain numbers.

NACDS

NUM Number	0	Possible first digit of inbound radio call
CDCAT TCD Category allowed to dial NUM	0&2&3	Extension, Private Network, and Public Network

This entry is repeated for 1, 2, and 3.

NACDS

NUM Number	4	Possible first digit of extension or CAD number
CDCAT TCD Category allowed to dial NUM	0&1&2&3	Extension, EDACS, Private Network, and Public Network

NACDS

NUM Number	500	First digits of DISA number used for inbound radio call
CDCAT TCD Category allowed to dial NUM	2&3	Private Network and Public Network

NACDS

NUM Number	9	LCR code for Public Network
CDCAT TCD Category allowed to dial NUM	0&1	Extension and EDACS

5.3.7. External Number Length

These entries allow dialing the EDACS radio ID directly after receiving EZDISA dial tone during inbound calls.

NANLS

EXL External Number	0	First Digit of EDACS LID
MIN Minimum Length	5	
MAX Maximum Length	5	

NANLS

EXL External Number	1	First Digit of EDACS LID
MIN Minimum Length	5	
MAX Maximum Length	5	

NANLS

EXL External Number	2	Prefix for EDACS GID
MIN Minimum Length	5	
MAX Maximum Length	5	

NANLS

EXL External Number	3	Prefix for Digital EDACS LID or GID
MIN Minimum Length	6	
MAX Maximum Length	6	

This entry is used in North America for 911 service dialing. When the LCR ENT table determines that 911 has been dialed, it modifies this number with the pre-digits 690. This number is then passed back to Number Analysis for direct external routing.

NANLS

EXL External Number	690911	Public Network Destination code + 911
MIN Minimum Length	6	
MAX Maximum Length	6	

5.4. TRAFFIC MATRIX

TMG CATEGORY

Extensions	0
EDACS Routes	1
Private Network Routes	2
Public Network Routes	3

NOTE

- Inserting entries in TMG 15 allows unrestricted connections and may result in telephone fraud.
- Allowing the Public Network or the Private Network to connect to themselves or each other may result in telephone fraud.
- Ericsson Inc. assumes no responsibility for telephone fraud resulting from the actions described above.

5.4.1. Traffic Connections

TCMAS

CON Connection Type	T	Traffic
A A-Party	0	Extensions
B B-Party	0&1&2&3	Extensions, EDACS, Private Network, and Public Network

TCMAS

CON Connection Type	T	Traffic
A A-Party	1	EDACS
B B-Party	0&2&3	Extensions, Private Network, and Public Network

TCMAS

CON Connection Type	T	Traffic
A A-Party	2	Private Network
B B-Party	0&1	Extensions and EDACS

TCMAS

CON Connection Type	T	Traffic
A A-Party	3	Public Network
B B-Party	0&1	Extensions and EDACS

5.4.2. Conference Connections

Only MD110 extensions can initiate a conference call.

TCMAS

CON Connection Type	C	Conference
A A-Party	0	Extensions
B B-Party	0&1&2&3	Extensions, EDACS, Private Network, and Public Network

TCMAS

CON Connection Type	C	Conference
A A-Party	1	EDACS
B B-Party	0&2&3	Extensions, Private Network, and Public Network

TCMAS

CON Connection Type	C	Conference
A A-Party	2	Private Network
B B-Party	0&1	Extensions and EDACS

TCMAS

CON Connection Type	C	Conference
A A-Party	3	Public Network
B B-Party	0&1	Extensions and EDACS

5.5. PUBLIC NETWORK LCR

5.5.1. LCR External Number Table

The first two entries apply only in North America and may not apply at all locations.

LCDDI

TAB Table	ENT	External Number Table
ENTRY Number	911	911
PRE Prefix	690	Public Network External Destination Code
CONF Conflict Number	NO	

LCDDI

TAB Table	ENT	External Number Table
ENTRY Number	9911	Public Network LCR + 911
TRC Truncate	1	One digit
PRE Prefix	690	Public Network External Destination Code
CONF Conflict Number	NO	

5.5.2. LCR Fictitious Destination Table

This entry is for normal Public Network call routing.

LCDDI

TAB Table	FDT	Fictitious Destination Table
FRCT Fictitious Route Choice	30	
PRE Prefix	690	Public Network External Destination Code
TZONE Time Zone	1	

5.5.3. LCR Default Routing

This entry is for default LCR call routing -- calls that LCR does not know how to route.

LCLDI

LIM	1	
AC LIM 1 Area Code	XXX	XXX must be entered in the script file
DEST External Destination Code	6XX	Public Network External Destination Code for numbers for which LCR has no entries. XX must be entered in the script file and will be 90 if these numbers should go to the Public Network. If these numbers should be blocked, enter a number between 91 and 99 (691-699) which has no routes (trunk groups) assigned.

The remainder of the entries are customer-specific. A text file to edit should be available from Ericsson in any country in which it is present.

5.6. ANALOG TEST EXTENSIONS

5.6.1. Common Class of Service Categories

Common Class of Service 0 is used for the MD110 test extensions.

Setting TCD or TMG to 15 results in maximum dialing privileges for the category of service.

EXCCS

CAT	0	
TRAF		
CAD Class	00	
TCD Category Night Mode	00	
TCD Category Day Mode	00	
Traffic Matrix Group	00	
SERV		
ACD Supervisor	0	No
Emergency Switching	0	No
Intrusion	02	Reception of call waiting tone allowed
DID	1	Can be a DID extension
Automatic Callback	2	Allowed toward extensions and trunks
Call Waiting Tone	07	Permitted to send CWT Can receive CWT from extension, operator, or DID trunk
CDIV		
Rerouting	0	Permitted on incoming calls
Do Not Disturb	0	Not allowed
External Call Forwarding	0	Not allowed
Diversion	00	All calls (Individual answer point required)
Diversion on Origin Internal Line Public External Line Private External Line	0 0 0 0	Not allowed
ROC		
FRL/TCM	0	Default level
Account Code	2	Never required
LCR Threshold	3	All routes allowed
Priority Routing	0	Normal extension

5.6.2. Extension Equipment

Extensions are initiated with the command EXTEI, and 4001 through 4008 are initialized.

EXTEI

DIR	4001&&4008	
CAT	0	
EQU		
LIM	1	
Magazine	X	X must be entered in the script file
Board Position	XX	XX must be entered in the script file
Board Circuit No.	0	
TYPE		EL6
TRM		
Transmission Category	0	No attenuation or amplification
ICAT		
Instrument Class	000	EL6 analog
Instrument type	0	Hookflash capable, normal intercept tone and normal ringing
ADC		
Bearer services	0	Speech and 3.1 kHz
CLI request	0	Not requested
CLI presentation	0	Allowed
Call metering	0	Not in US (Per route)
Malicious call trace	0	Not in US
Manual message waiting	0	Not allowed
Transfer outgoing calls	0	Not allowed to accept transferred or to transfer outgoing external calls
Authorization code	0	Does not need to match extensions
Network affiliation	0	Common public number sent to network

5.7. COMMON ABBREVIATED DIALING NUMBERS

Common Abbreviated Dialing (CAD) numbers are common speed dial numbers. An extension's or route's CAD class determines which CAD numbers it may use. The CAD classes are assigned as follows:

CAD CLASS

Extensions	0
EDACS Routes	1
Private Network Routes	2
Public Network Routes	3

5.7.1. Extensions and EDACS to Public Network

ADCOI

ABB Abbreviated number	4XXX	XXX must be entered in the script file and will be between 100 and 999
TRA Translated number	9XXXX	XXXX must be entered in the script file and will be between 1 and 19 digits
CLASS	0&1	Allowed for Extensions and EDACS to Public Network

5.7.2. Extensions and Public Network to EDACS

These CAD numbers may be used to provide DID to up to 900 radios in the example script file. Any CAD numbers used for extensions and EDACS to the Public Network reduce the number available for DID to EDACS. The Public Network must DID the number defined by ABB (Abbreviated number). The number defined by TRA is the radio number. Another method to provide DID to all radios without using CAD is described in section 10.

See Table 1 for the EDACS number plan.

ADCOI

ABB Abbreviated number	4XXX	XXX must be entered in the script file and will be between 100 and 999
TRA Translated number	XXXXX	XXXXX must be entered in the script file and will be between 5 and 6 digits
CLASS	0&3	Allowed for Extensions and Public Network to EDACS

5.8. AUTHORIZATION CODES

EZDISA Access
- Requires software patch 34180.
- Inbound interconnect calls to the DISA number allow dialing a radio without entering an Authorization Code.
- An Authorization Code can allow greater calling privileges. Normally, this feature is not used.

DISA Access
- Inbound interconnect calls to the DISA number require an Authorization Code before dialing a radio.

Creating Authorization Codes that have a Common Class of Service
1. Allow CAD numbers to the Public Network.
2. Have TMG that allow connection to the Public Network.
3. Have TCD Category that allows dialing of Public Network LCR codes or Public Network External Destination codes.
4. May result in telephone fraud if the codes are used by unauthorized callers.

AUCOI

AUTH Authorization Code	XXXX	XXXX must be entered in the script file and will be 1 to 7 digits in length, with the first digits being other than 0
CILCOD Call Information Logging Number	XXXX	XXXX must be entered in the script file and will be 1 to 6 digits
CAT Common Class of Service Category	XX	XX must be entered in the script file and will be 0 to 63; the Common Class of Service category must be defined
CHECK	NO	Code does not have to match extension

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6. LIM CONFIGURATIONS FOR PUBLIC NETWORK CONNECTIONS

6.1. PI-MD110 NORTH AMERICAN ISDN ROUTE

6.1.1. Route Class

ROCAI

ROU	10	
SEL		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
TRM		
Transmission Category	7	Digital CO or DID trunk
SERV		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	0	Controlled by extension COS
Request of CLI	1	Controlled by extension COS
Number conversion	0	No
TRAF		
CAD Class	01	
TCD Category Night Mode	01	
TCD Category Day Mode	01	
Traffic Matrix Group	01	

ROCAI (Cont.)

SIG		
Dial tone	1	Dial tone is provided by the CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	1	Yes
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	1	Generated by PBX
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	3	ISDN
NET services	1	Tie line with COS for net service facilities
BCAP		
64 kbits unrestricted	1	Yes
64 kbits restricted	1	Yes
3.1 kHz audio	1	Yes
Speech	1	Yes
7kHz audio UDI-TA	1	Yes

6.1.2. Route Data

RODAI

ROU	10	
TYPE	SL63	TLU-77/1 board
VARC		
Constant	00000	
Characteristics	0	Does not send ring tone No overlap receiving Trunk with signaling No reanswer service for incoming traffic
Constant	0	
Type	0	PRI ISDN

RODAI (Cont.)

VARI		
Constant	0000000	
Type	3	AT&T 5ESS ISDN
VARO		
Constant	000000	
Characteristics	B	Restart interface one channel at a time No fixed connection between B-channel and trunk line Outgoing call has priority at collision Acting as network side
User Services	7	User info service 3 (in active state) User info service 2 (before active state) User info service 1 (user-user info element)

6.1.3. Route Equipment

ROEQI

ROU	10	
TRU		
LIM-Trunk	1-1&&1-23	
EQU		
LIM	1	
Magazine	X	This information must be entered in the script file.
Board position	XX	This information must be entered in the script file.
Board Circuit No.	0	First circuit on board
INDDAT		
Constant	00000000000	
Characteristics	0	B8ZS, ESF, LAPD

6.1.4. External Destination Codes

RODDI

DEST	0	Destination code
ROU	10	
ADC		
Trunk seizure	1	After minimum number length
Called Number type	0	Unknown
Number series	0	Variable length
Calling Number type public	0	Unknown
Calling Number type private	5	Unknown
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminate seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
PNR Number Translation Use	0	No Translation
SRT	1	Start digit for outgoing calls

External Destination Codes 1, 2, and 3 are identical to 0.

6.2. PUBLIC NETWORK NORTH AMERICA T1 DID TRUNK

With Line Clearing and Without B-Answer

A DID trunk can connect the caller to DISA, provided a DID number is the MD110 DISA number. Other DID numbers can be used to provide direct dialing to a radio with a public network number. The DID number must be translated to a radio LID or GID with Common Abbreviated Dialing (CAD). CAD entries are limited to 1000.

Please refer to section 2.2 for a discussion of line clearing and B-answer supervision.

6.2.1. Route Class

ROCAI

ROU	3X	This information must be added to the script file and X will be 0-9. Make the first Public Network route 30.
SEL		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	0	Blocked for outgoing calls
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
TRM		
Transmission Category	7	Digital CO or DID trunk
SERV		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	0	Not allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	1	Not allowed
Request of CLI	0	Not allowed
Number conversion	0	No
TRAF		
CAD Class	03	
TCD Category Night Mode	03	
TCD Category Day Mode	03	
Traffic Matrix Group	03	

ROCAI (Cont.)

SIG		
Dial tone	0	Dial tone not sent
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	0	No
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	0	A-party receives from B-party
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	0	Dial pulse or DTMF
NET services	0	No net service facilities
BCAP		
64 kbits unrestricted	0	No
64 kbits restricted	0	No
3.1 kHz audio	1	Yes
Speech	1	Yes
7 kHz Audio	0	No

6.2.2. Route Data

RODAI

ROU	3X	This information will match the entry under ROCAI.
TYPE	TL45	TLU-45 trunk
VARC		
Constant	0000000	
Characteristics	1	Common Control CO DID
VARI		
Constant	0000000	
Characteristics	6	DTMF Wink PTS

6.2.3. Route Equipment

ROEQI

ROU	3X	This information will match the entry under ROCAI.
TRU		
LIM-Trunk	1-1&&1-X	This information must be added to the script file. X is a function of the number of DID channels in the T1.
EQU		
LIM	1	
Magazine	X	This information must be added to the script file.
Board position	XX	This information must be added to the script file.
Board Circuit No.	X	This information must be added to the script file. It is a function of the DID channel position in the T1.
INDDAT		
Constant	000000000 0	
	0	No block on excessive slip
	E	CCS B8ZS ESF No DMI

6.3. NORTH AMERICA T1 BOTHWAY GROUND START TRUNK

With Line Clearing and Without B-Answer

The Public Network should place all Ground Start channels in the T1 into a hunt group so that inbound callers need only remember one public number. Please refer to section 2.2 for a discussion of line clearing and B-answer supervision.

6.3.1. Route Class

ROCAI

ROU	3X	This information must be added to the script file. X will be 0-9. Make the first Public Network route 30.
SEL		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted

ROCAI (Cont.)

Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
TRM		
Transmission Category	7	Digital CO or DID trunk
SERV		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	1	Not allowed
Request of CLI	0	Not allowed
Number conversion	0	No
TRAF		
CAD Class	03	
TCD Category Night Mode	03	
TCD Category Day Mode	03	
Traffic Matrix Group	03	
SIG		
Dial tone	1	Dial tone provided by CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	0	No
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	0	A-party receives from B-party
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers

ROCAI (Cont.)

Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	0	Dial pulse or DTMF
NET services	0	No net service facilities
BCAP		
64 kbits unrestricted	0	No
64 kbits restricted	0	No
3.1 kHz audio	1	Yes
Speech	1	Yes
7 kHz audio	0	No

6.3.2. Route Data

RODAI

ROU	3X	This information will match the entry under ROCAI.
TYPE	TL45	TLU-45 trunk
VARC		
Constant	0000000	
Characteristics	2	Common Control CO Ground start
VARI		
Constant	0000000	
Characteristics	6	DTMF Wink PTS
VARO		
Constant	0000000	
Characteristics	3	No B-answer supervision DTMF Wink PTS

6.3.3. Route Equipment

ROEQI

ROU	3X	This information will match the entry under ROCAI.
TRU		
LIM-Trunk	1-1&&1-X	This information must be added to the script file and X is a function of the number of bothway channels in the T1.
EQU		
LIM	1	
Magazine	X	This information must be added to the script file.
Board position	XX	This information must be added to the script file.
Board Circuit No.	X	This information must be added to the script file. It is a function of the trunk channel position in the T1.
INDDAT		
Constant	0000000000	
	0	No block on excessive slip
	E	CCS B8ZS ESF No DMI

6.3.4. External Destination Codes

If there are multiple routes for outbound calls, an External Destination Code containing T1 and Analog CO trunk routes should place the T1 route before the Analog route. CHO=1 as a parameter for RODDI will make the route the first alternate choice (5 alternates allowed). Leaving this parameter out will make the route the primary choice.

RODDI

DEST	690	
ROU	3X	This information will match the entry under ROCAI.
ADC		
Trunk seizure	0	Immediate
Called Number type	0	Unknown
Number series	0	Variable length
Calling Number type public	0	Unknown
Calling Number type private	5	Unknown
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminating seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
PNR Number Translation Use	0	No Translation
SRT	4	Start digit for outgoing calls

6.3.5. Inbound Call Routing

This directs calls to DISA.

RODNI

ROU	3X	This information will match the entry under ROCAI.
DAY	5000	Route incoming calls to DISA during day
NIG	5000	Route incoming calls to DISA during night

6.4. NORTH AMERICA ANALOG CO TRUNK

With Line Clearing and Without B-Answer

Please refer to section 2.2 for a discussion of line clearing and B-answer supervision.

6.4.1. Route Class

ROCAI

ROU	3X	This information must be added to the script file. X will be 0-9. Make the first Public Network route 30.
SEL		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
TRM		
Transmission Category	6	Analog CO or DID trunk
SERV		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	1	Not allowed
Request of CLI	0	Not allowed
Number conversion	0	No

ROCAI (Cont.)

TRAF		
CAD Class	03	
TCD Category Night Mode	03	
TCD Category Day Mode	03	
Traffic Matrix Group	03	
SIG		
Dial tone	1	Dial tone provided by CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	0	No
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	0	A-party receives from B-party
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	0	Dial pulse or DTMF
NET services	0	No net service facilities
BCAP		
64 kbits unrestricted	0	No
64 kbits restricted	0	No
3.1 kHz audio	1	Yes
Speech	1	Yes
7 kHz Audio	0	No

6.4.2. Route Data

RODAI

ROU	3X	This information will match the entry under ROCAI.
TYPE	TL1	TLU-41 trunk
VARC		
Constant	0000000	
Characteristics	6	Common Control CO Loop start
VARI		
Constant	0000000	
Characteristics	2	Loop start Clear signal incoming
VARO		
Constant	0000000	
Characteristics	D	Dial tone from public exchange DTMF Clear signal outgoing No B-answer signal

6.4.3. Route Equipment

ROEQI

ROU	3X	This information will match the entry under ROCAI.
TRU		
LIM-Trunk	1-1&&1-X	X is a function of the number of trunks and can not be greater than 4.
EQU		
LIM	1	
Magazine	X	This information must be added to the script file.
Board position	XX	This information must be added to the script file.
Board Circuit No.	0	First circuit on board

6.4.4. External Destination Codes

If there are multiple routes for outbound calls, an External Destination Code containing T1 and Analog CO trunk routes should place the T1 route before the Analog route. CHO=1 as a parameter for RODDI will make the route the first alternate choice (5 alternates allowed). Leaving this parameter out will make the route the primary choice.

RODDI

DEST	690	
ROU	3X	This information will match the entry under ROCAI.
ADC		
Trunk seizure	0	Immediate
Called Number type	0	Unknown
Number series	0	Variable length
Calling Number type public	0	Unknown
Calling Number type private	5	Unknown
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminating seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
PNR Number Translation Use	0	No Translation
SRT	4	Start digit for outgoing calls

6.4.5. Inbound Call Routing

This directs calls to DISA.

RODNI

ROU	3X	This information will match the entry under ROCAI.
DAY	5000	Route incoming calls to DISA during day
NIG	5000	Route incoming calls to DISA during night

6.5. PI-MD110 ISDN ERICSSON ROUTE

6.5.1. Route Class

ROCAI

ROU	10	
SEL		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
TRM		
Transmission Category	7	Digital CO or DID trunk
SERV		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	0	Controlled by extension COS
Request of CLI	1	Controlled by extension COS
Number conversion	0	No
TRAF		
CAD Class	01	
TCD Category Night Mode	01	
TCD Category Day Mode	01	
Traffic Matrix Group	01	

ROCAI (Cont.)

SIG		
Dial tone	1	Dial tone is provided by the CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	1	Yes
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	1	Generated by PBX
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	3	ISDN
NET services	1	Tie line with COS for net service facilities
BCAP		
64 kbits unrestricted	1	Yes
64 kbits restricted	1	Yes
3.1 kHz audio	1	Yes
Speech	1	Yes
7 kHz audio	1	Yes

6.5.2. Route Data

RODAI

ROU	10	
TYPE	SL60	TLU-76/1 board
VARC		
Constant	00000	
Characteristics	0	Does not send ring tone No overlap receiving Trunk with signaling No reanswer service for incoming traffic
Constant	0	
Type	0	PRI ISDN
VARI		
Constant	00000000	

RODAI (Cont.)

VARO		
Protocol	0	ECMA/ETSI
	0	No Blocking on slip No connected number IE in connect message No user-user information in Alerting message No semipermanent connection
	3	No fixed connection between B-channel and trunk line Layer 1 is Master Layer 2 is NT1 Layer 3 is Network
	F	User info service 3 (in active state) User info service 2 (before active state) User info service 1 (user-user info element) Public trunk line
Constant	00	
	0	No charging request at call setup Continuos charging No CUG sent to Network
	0	Service Code + CUG CUG Index 0

6.5.3. Route Equipment

ROEQI

ROU	10	
TRU		
LIM-Trunk	1-1&&1-15	
EQU		
LIM	1	
Magazine	X	This information must be entered in the script file.
Board position	XX	This information must be entered in the script file.
Board Circuit No.	1	
ROU	10	
TRU		
LIM-Trunk	1-16&&1-30	

ROEQI (Cont.)

EQU		
LIM	1	
Magazine	X	This information must be entered in the script file.
Board position	XX	This information must be entered in the script file.
Board Circuit No.	17	

6.5.4. External Destination Codes

RODDI

DEST	0	Destination code
ROU	10	
ADC		
Trunk seizure	1	After minimum number length
Called Number type	0	Unknown
Number series	0	Variable length
Calling Number type public	0	Unknown
Calling Number type private	5	Unknown
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminate seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
PNR Number Translation Use	0	No Translation
SRT	1	Start digit for outgoing calls

External Destination Codes 1, 2, and 3 are identical to 0.

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7. LIM CONFIGURATIONS FOR PRIVATE NETWORK CONNECTIONS

The Private Network is considered to be another PBX to which the MD110 connects, as well as a true Private Network the customer may own or lease. When connecting to another PBX, number conflicts may occur. The following codes are recommended for directing calls out of the MD110. If "8" is used for access to the PBX for outbound calls and the basic configuration script is followed, then the "7" for EDACS inbound calls is not necessary and direct dialing of the LID after DISA dial tone can still be used.

LCR

	Number
EDACS	7
Private Network	8
Public Network	9

- Tie lines are used between the MD110 and the other PBX, not CO type trunks or lines.
- If the other PBX allows connection to lines without line clearing, the information below should be considered.

7.1. NORTH AMERICA T1 TIE LINES

With Line Clearing and Without B-Answer

The following information is not in the basic script file and must be added if used. Please refer to section 2.2 for a discussion of line clearing and B-answer supervision.

7.1.1. Route Class

ROCAI

ROU	2X	This information must be added to the script file. X will be 0-9. Make the first Private Network route 20.
SEL		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
TRM		
Transmission Category	5	Digital Tie trunk

ROCAI (Cont.)

SERV		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	1	Tie
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	1	Not allowed
Request of CLI	0	Not allowed
Number conversion	0	No
TRAF		
CAD Class	02	
TCD Category Night Mode	02	
TCD Category Day Mode	02	
Traffic Matrix Group	02	
SIG		
Dial tone	1	Dial tone provided by CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	0	No
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	0	A-party receives from B-party
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	0	Dial pulse or DTMF
NET services	0	No net service facilities
BCAP		
64 kbits unrestricted	0	No
64 kbits restricted	0	No
3.1 kHz audio	1	Yes
Speech	1	Yes
7 kHz audio	0	No

7.1.2. Route Data

RODAI

ROU	2X	This information will match the entry under ROCAI.
TYPE	TL45	TIU-45 trunk
VARC		
Constant	0000000	
Characteristics	3	Common Control Tie Line
VARI		
Constant	0000000	
Characteristics	6	DTMF Wink PTS
VARO		
Constant	0000000	
Characteristics	3	No B-answer supervision DTMF Wink PTS

7.1.3. Route Equipment

ROEQI

ROU	2X	This information will match the entry under ROCAI.
TRU		
LIM-Trunk	1-1&&1-23	
EQU		
LIM	1	
Magazine	X	This information must be added to the script file.
Board position	XX	This information must be added to the script file.
Board Circuit No.	0	First circuit on board.
INDDAT		
Constant	0000000000	
	0	No block on excessive slip.
	E	CCS B8ZS ESF No DMI

7.1.4. External Destination Codes

RODDI

DEST	680	
ROU	2X	This information will match the entry under ROCAI.
ADC		
Trunk seizure	0	Immediate
Called Number type	0	Unknown
Number series	0	Variable length
Calling Number type public	0	Unknown
Calling Number type private	5	Unknown
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminating seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
PNR Number Translation Use	0	No Translation
SRT	4	Start digit for outgoing calls

7.1.5. Inbound Call Routing

The other PBX dials the DISA number for inbound calls to radios.

7.2. PRIVATE NETWORK LCR

- The "8" LCR code will be initialized in the same manner as the "9" for the Public Network LCR.
- The LCR tables for “8” are installation-dependent.
- Radios and MD110 extensions will use "8" to access the Private Network.

8. DIRECT INBOUND RADIO CALLS IN A PBX NETWORK

This example shows how to retain direct inbound EDACS dialing and provide direct outbound dialing. No access code is needed to select EDACS for inbound Private Network calls, and no access code is needed by the radios to reach the Private Network. This is possible if the customer does not require that the MD110 extensions have the same ease of function. MD110 extensions may direct dial an EDACS radio, but must use an “8” to call extensions on the other PBX. It is possible to provide direct dialing to the MD110 extensions from EDACS or the other PBX extensions if the MD110 and other PBX number series do not overlap.

Direct inbound dialing and Direct outbound dialing are possible when MD110 extensions are not used or their operating characteristics are not important.

Requirements

- Customer will only have test extensions on the MD110 and will use the "8" access code to call from the MD110 extension to the other PBX.
- Customer wants direct outbound radio dialing to the other PBX extensions that are 4-digit numbers in the range 1000-4999. Dialing an "8" before the extension number is not acceptable.
- Customer wants “9+” dialing routed to the other PBX which it will route to the Public Network.
- Customer wants “8+” dialing routed to the other PBX which it will route to the Private Network.
- MD110 extensions are in 5001-5999 range.

Implementation

The basic script file is used with the following changes:

- The "8" LCR code is initialized.
- The "8" LCR code routes calls to the other PBX.
- All outbound radio calls are prefixed with "8" by the MD110.
- MD110 extensions and EDACS radios are enabled with NACDS to dial "8+" numbers.
- The script file is changed to move extensions from the 4000-4099 range to the 5001-5999 range.

A step-by-step process is not presented; the information is provided for someone with basic MD110 programming skills.

This entry creates the automatic "8" prefix for all outbound radio calls.

RONDI

ROU	10	EDACS Route
PRE Prefix	8	Inserted in front of digits sent from EDACS to the MD110

LCR Tables

This command causes outbound radio calls to 9911 to be passed to the other PBX as 9911.

LCDDI

TAB Table	ENT	External Number Table
ENTRY Number	89911	9+911
TRC Truncate	1	One digit
PRE Prefix	680	Private Network External Destination Code
CONF Conflict Number	N	

LCDDI

TAB Table	FDT	Fictitious Destination Table
FRCT Fictitious Route Choice	20	
PRE Prefix	680	Public Network External Destination Code
TZONE Time Zone	1	

LCLDI

LIM	1	
AC LIM 1 Area Code	XXX	XXX must be entered in the script file
DEST External Destination Code	6XX	Private Network External Destination Code for numbers for which LCR has no entries. XX must be entered in the script file and will be 80 if these numbers should go to the Private Network. If these numbers should be blocked, enter a number between 81 and 89 (681-689) which has no routes (trunk groups) assigned**.**

This entry is for direct 4-digit outbound radio dialing to extension range 1000-1999 on the other PBX.

LCDDI

TAB Table	NLT	Number Length Table
ENTRY	81	
CONF	Y	
MIN	5	
MAX	5	

- Similar entries will be made for extension series 2000-4999.
- All “8+” dialing entries will have an “8” in front of the “8,” and the appropriate MIN and MAX.
- All “9+” dialing entries will have an “8” in front of the “9,” and the appropriate MIN and MAX.

Direct dialing to MD110 extensions from the other PBX extensions is accomplished by simply dialing the MD110 extension number.

Direct dialing by radios to MD110 extensions is accomplished with this entry.

LCDDI

TAB Table	NLT	Number Length Table
ENTRY	85	
TRC	1	One digit
CONF	Y	
MIN	5	
MAX	5	

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9. INDIRECT INBOUND RADIO CALLS IN A PBX NETWORK

This scenario emphasizes the number conflicts that can arise when **using the MD110 as a PBX and as an EDACS telephone interconnect**. If the customer wants direct dial to extensions 1000-1999 on the other PBX, direct dial to EDACS radios can not be provided without an EDACS selector code.

- The number conflict cannot be resolved for the MD110 extension, since both the EDACS radio number and other PBX extensions both start with a "1." Therefore, a "7" EDACS LCR code is used.
- If the tie line dialed the DISA number plus the EDACS LCR code for inbound calls to the DISA number, direct inbound calls should be possible. The caller would not have to enter the "7" EDACS LCR Code.

Requirements

- Customer will have extensions on the MD110 and requires direct 4-digit dialing to the other PBX extensions; dialing an “8” is not acceptable.
- Customer wants direct outbound radio dialing to the other PBX extensions that are 4-digit numbers in the range 1000-2999 and 6000-6999. Dialing an “8” before the extension number is not acceptable.
- Customer wants direct radio outbound dialing to MD110 extensions in the range 4000-4999.
- Customer wants “9+” dialing routed to the other PBX which it will route to the Public Network.
- Customer wants direct 4-digit dialing from the other PBX to the MD110.

Implementation

The basic script file is used with the following changes:

- The “7” LCR code is initialized for inbound EDACS calls by MD110 extensions or the Private Network. The “7” LCR code routes calls to EDACS.
- MD110 extensions and the Private Network are enabled to dial “7+” numbers; enabled with NACDS.
- The “8” LCR code is not initialized.
- The External Destination Codes are moved from the 670-699 range to the 570-599 range.
- The NACDS, NANLS, and RODDI entries for 0, 1, 2, and 3 are deleted and new entries are made.

A step-by-step process is not presented; information is provided for someone with MD110 programming skills.

EDACS LCR

The following two entries are for valid radio calls.

LCDDI

TAB Table	NLT	Number Length Table
ENTRY	70	
CONF	Y	
MIN	6	
MAX	6	

This entry is repeated for 71 and 72.

LCDDI

TAB Table	NLT	Number Length Table
ENTRY	73	
CONF	Y	
MIN	7	
MAX	7	

The following entry is for invalid radio calls.

LCDDI

TAB Table	NLT	Number Length Table
ENTRY	74	
CONF	Y	
MIN	2	
MAX	2	

This entry is repeated for 75, 76, 77, 78, and 79.

LCDDI

TAB Table	FDT	Fictitious Destination Table
FRCT Fictitious Route Choice	10	
PRE Prefix	570	EDACS External Destination Code
TZONE Time Zone	1	

LCDDI

TAB Table	DNT2	Destination Number Table 2
ENTRY	70	
TRC Truncate	1	One digit
FRCT **Fictitious Route Choice**	10	
TOLL TCD Category 14-0	000000000001101	MD110 Extensions, the Private Network, and the Public Network may call these numbers; TCD 0, 2, and 3 are allowed
TYPE	2	National Number Plan

This entry is repeated for 71, 72, and 73.

LCDDI

TAB Table	DNT2	Destination Number Table 2
ENTRY	74	
TRC Truncate	1	One digit
FRCT **Fictitious Route Choice**	10	
TOLL TCD Category 14-0	000000000000000	Calls is denied for all TCD except 15
TYPE	2	National Number Plan

This entry is repeated for 75, 76, 77, 78, and 79.

This sets the External Destination Code for calls to EDACS.

RODDI

DEST	570	Destination code
ROU	1	
ADC		
Trunk seizure	0	Immediate
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminate seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
SRT	4	Start digit for outgoing calls

Other PBX Extensions

The following three entries will provide for direct dialing to the other PBX extensions for numbers in the 1000-1999 range.

NACDS

NUM Number	1	Possible first digit of outbound radio call or MD110 extension call to other PBX extension
CDCAT TCD Category allowed to dial NUM	0&1	Extension and EDACS allowed

NANLS

EXL External Number	1	First digit of other PBX extension
MIN Minimum length	4	
MAX Maximum Length	4	

RODDI

DEST	1	Destination code
ROU	20	
ADC		
Trunk seizure	0	Immediate
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminate seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
SRT	1	Start digit for outgoing calls

The preceding three entries must be made for 2 and 6 (extensions 2000-2999 and 6000-6999).

LCR Code 9 tables must be generated per the customer's requirements.

10. DID TO ALL EDACS RADIOS

With tie lines and another PBX, it is possible to provide DID calling to all radios.

- The other PBX will have its access code for EDACS.
- After the access code, the caller will dial the radio number. The other PBX sends the radio number across the tie line. In some cases, the other PBX will prefix the dialed radio number with the MD110 EDACS LCR code (only if EDACS LCR is used).
- If the other PBX extension numbers are four-digit numbers and the called party's phone number is the same as the last four digits of his radio LID, then remembering the person's DID number becomes simple. Dial an EDACS access code followed by the person's extension number, which the PBX routes to the MD110. The other PBX will need to prefix the four-digit number dialed with a "0" or "1" (first digit of LID) and an EDACS LCR code if used.

Common Abbreviated Dialing is used in the basic script configuration to provide DID for up to 900 radios. (The maximum number of CAD numbers in a system is 1400.) It maps numbers in the 4100-4999 range to arbitrary radio numbers. The LCR ENT table can be used to translate numbers into EDACS radio numbers also. It requires that the first digit of the DID number be an LCR code in the MD110.

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11. DTMF DIALING BY RADIOS

11.1. MANUAL DTMF DIALING

Most radios will digitally dial a phone number with EDACS signaling. Some radios do not have a numeric keypad, but do possess a DTMF microphone. The radio can be programmed with the DISA number which can be sent for interconnect access. This number will result in dial tone returned to the radio, after which the radio will send DTMF tones using the DTMF microphone.

- The number the radio sends initially will be the DISA number.
- The MD110 will return dial tone, then accept DTMF digits from the radio.
- This may result in unrestricted calling, except in the case where another PBX toll restricts the call.

11.2. RADIO TRANSFERRED DTMF DIALING

The procedure for manual DTMF dialing applies except if the radio is equipped with a keypad, radio digits may be entered via the keypad followed by PTT to send the digits rather than using the DTMF microphone. In this case, the radio must be programmed for DTMF pulse width and interdigit delay for the MD110 to correctly interpret the digits as specified in the LBI-39000 DTMF radio programming section.

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12. APPENDIX A
JESSICA PBX GATEWAY QUESTIONNAIRE -- MD110 CONFIGURATION

MD110 CONFIGURATION INFORMATION

PROJECT INFORMATION

CUSTOMER/PROJECT: ________________________________ COUNTRY: ________________

CONTACTS:

	Customer System Administrator	Ericsson Inc. System Engineer	EBN MD110 Installer
Name:	____________________	____________________	____________________
Phone:	____________________	____________________	____________________

JESSICA/MD110 INTERNAL INTERFACE

A T1 or E1 ISDN trunk is used to provide the Jessica internal interface connection between the PBX Interface (PI) and the MD110. This allows for up to a maximum of 23 (T1) or 30 (E1) simultaneous interconnect calls to be handled by Jessica. The type of digital trunk to be used depends on the interface standards followed by the country of installation.

Which type of digital trunk is used for connecting the PI to the MD110:

__ T1 ISDN Span
__ E1 ISDN Span

JESSICA/MD110 EXTERNAL INTERFACE

To which kind of switching equipment is the MD110 externally connected (indicate all that apply):

__ Public Switched Telephone Network (PSTN)
__ Private Branch Exchange (PBX)
__ Other: ____

TRUNK LINE CONNECTIONS AND CHARACTERISTICS

The Jessica/MD110 supports a variety of external terminations. MD110 trunk connections can be analog and/or digital, and of several different types. The type(s) of trunks used will depend on the application, and the external interface indicated above. The following questions pertain only to the Jessica/MD110 external interface.

What are the types and number of trunk lines used (see below for more information on each type of trunk):

Analog Trunks	No. of Trunks
__ Analog CO (Central Office) Trunk	_____
__ Analog DID (Direct Inward Dial) Trunk	_____
__ Analog TIE Trunk	_____

Digital Trunks	No. of Trunks/Spans
__ Digital CO (Central Office) Trunk	_____
__ Digital DID (Direct Inward Dial) Trunk	_____
__ Digital TIE Trunk	_____
__ 23B+D PRI (T1 ISDN Span)	_____
__ 30B+D PRI (E1 ISDN Span)	_____

Note: T1 or E1 TIE trunks are highly recommended for connecting the MD110 to another PBX.

For each of the trunk types used, the information on the following pages is required. Copies of the attached form may be used to provide this information.

ANALOG TRUNKS

Analog trunk lines can be CO trunks, DID trunks, or TIE trunks.

Analog CO Trunks

CO trunks are used to interconnect to/from the PSTN. These trunks can operate as either Loop Start or Ground Start circuits; however, Ground Start are preferred.

- Which trunks will be through the switch?

- Which of the trunks used in the switch are Incoming only, which are Outgoing only, and which are Bothway (INC, OUT, BWT)?

- Are any of the trunks which are to be used through the MD110 Loop Start versus Ground Start? If Loop Start trunks are used, then it is highly recommended that they be converted to Ground Start prior to cutover.

- Indicate which of the following apply:

  __ Ground Start *or* Loop Start
  __ Forward Line Clearing
  __ Backward Line Clearing
  __ B-Answer Supervision
  __ Dial Pulse *or* DTMF
  __ Common Control CO *or* Step-by-Step (a few older COs still use Step-by-Step switching equipment)

- Which trunk lines are in a hunting arrangement (CO provided) with each other, and in which order?

- Where should each incoming trunk group and individual trunk terminate (DISA, console, extension, hunt group)? Note: A standard Jessica configuration would use DISA termination.

(Reminder: Need to provide 1 dedicated Loop Start line for the MD110 modem to be used for remote diagnostics and programming. Phone Number: ___________________________)

Analog DID Trunks

DID trunks are a special type of CO trunk used to interconnect from the PSTN, and operate in an incoming-only mode. These trunks allow callers to dial in directly to a station.

- What is the assigned DID number range? ____________ through ____________

- How many digits are being sent by the Central Office? ____________

- Should vacant numbers be intercepted? ____________
  Where? ____________

- Indicate which of the following apply:

  __ Forward Line Clearing
  __ Backward Line Clearing
  __ B-Answer Supervision
  __ Dial Pulse *or* DTMF
  __ Common Control CO *or* Step-by-Step (a few older COs still use Step-by-Step switching equipment)
  __ PTS (Proceed to Send) type: Wink Start *or* Delay Dial

Analog TIE Trunks

TIE trunks are used to interconnect to/from another PBX switch. These trunks operate in E&M signaling mode, and are compatible with either 2-wire (Type I) or 4-wire (Type II) E&M signaling methods.

- Which of the trunks used are Incoming only, which are Outgoing only, and which are Bothway (INC, OUT, BWT)?

- Indicate which of the following apply:

  __ 2-wire E&M *or* 4-wire E&M
  __ Forward Line Clearing
  __ Backward Line Clearing
  __ B-Answer Supervision
  __ Dial Pulse *or* DTMF
  __ PTS (Proceed to Send) type: Wink Start *or* Delay Dial *or* Tone *or* Wink+Tone

- List the existing access code(s) and the circuit ID(s).

- Where do TIE lines terminate (location of outbound terminating end)? ____________

  Provide name and phone number of contact at that location.

DIGITAL TRUNKS

The MD110 supports several different digital trunks, or digital multiplexed interface standards. T1, E1, and ISDN PRI (Primary Rate Interface) service can be used to provide digital CO, DID, or TIE trunks. The type of digital trunk service used depends on the interface standards followed by the country of installation.

T1 Span

T1 refers to the 24-channel digital multiplexed interface standard for digital transmission commonly used in North America, and some other countries in the world (parts of the Far East, South America, etc.). A T1 Span is used to provide up to 24 digital trunked channels or lines between the MD110 and PSTN (CO and/or DID trunks), or between the MD110 and another PBX (TIE trunks). Note that all 24 available channels do not have to be used.

For each T1 Span:

- List the circuit IDs and channel numbers, and indicate how the channels are to be used: CO (Incoming only, Outgoing only, Bothway), DID, or TIE. Note: A single T1 Span between the MD110 and PSTN can be configured to provide both common CO and DID trunk service (i.e., several channels used for CO trunks, and several channels used for DID trunks).

- Indicate which of the following apply:

  __ Forward Line Clearing
  __ Backward Line Clearing
  __ B-Answer Supervision
  __ Dial Pulse *or* DTMF
  __ Common Control CO *or* Step-by-Step (a few older COs still use Step-by-Step switching equipment)
  __ If CO trunk, then: Ground Start *or* Loop Start
  __ PTS (Proceed to Send) type: Wink Start *or* Tone *or* Wink+Tone

- Indicate the T1 signaling and line coding which apply:

  __ Signaling: CAS (Channel Associated Signaling) *or* CCS (Common Channel Signaling)
  __ Line Coding: ZCS (Zero Code Suppression) *or* B8ZS (Bipolar 8 Zero Substitution)

- Indicate the T1 framing format which applies (dependent on CSU):

  __ Framing Format: D4 *or* ESF (Extended Super Frame)

- For CO trunks, indicate where each incoming trunk group should terminate (DISA, console, extension, hunt group). Note: A standard Jessica configuration would use DISA termination.

- For DID service, provide the following information:

  What is the assigned DID number range? ____________ through ____________

  How many digits are being sent by the Central Office? ____________

  Should vacant numbers be intercepted? ____________
  Where? ____________

- For TIE trunks, list the existing access codes and circuit IDs, and indicate where the TIE lines terminate (location of outbound terminating end). Provide name and phone number of contact at that location.

E1 Span

E1 refers to the 32-channel digital multiplexed interface standard for digital transmission commonly used in Europe, and many other countries in the world. An E1 Span is used to provide up to 30 digital trunked channels or lines between the MD110 and PSTN (CO and/or DID trunks), or between the MD110 and another PBX (TIE trunks). The 2 additional channels are used for synchronization (channel 0), and a common signaling channel (channel 16). Note that all 30 channels available for digital trunking do not have to be used.

For each E1 Span:

- List the circuit IDs and channel numbers, and indicate how the channels are to be used: CO (Incoming only, Outgoing only, Bothway), DID, or TIE. Note: A single E1 Span between the MD110 and PSTN can be configured to provide both common CO and DID trunk service (i.e., several channels used for CO trunks, and several channels used for DID trunks).

- Indicate which of the following apply:

  __ Forward Line Clearing
  __ Backward Line Clearing
  __ B-Answer Supervision
  __ Dial Pulse *or* DTMF
  __ Common Control CO *or* Step-by-Step (a few older COs still use Step-by-Step switching equipment)
  __ If CO trunk, then: Ground Start *or* Loop Start
  __ PTS (Proceed to Send) type: Wink Start *or* Tone *or* Wink+Tone

- Indicate the E1 signaling and line coding which apply:

  __ Signaling: TBD
  __ Line Coding: TBD

- Indicate the E1 framing format which applies (dependent on CSU):

  __ Framing Format: TBD

- For CO trunks, indicate where each incoming trunk group should terminate (DISA, console, extension, hunt group). Note: A standard Jessica configuration would use DISA termination.

- For DID service, provide the following information:

  What is the assigned DID number range? ____________ through ____________

  How many digits are being sent by the Central Office? ____________

  Should vacant numbers be intercepted? ____________
  Where? ____________

- For TIE trunks, list the existing access codes and circuit IDs, and indicate where the TIE lines terminate (location of outbound terminating end). Provide name and phone number of contact at that location.

MD110 NUMBERING PLAN

A numbering plan and corresponding number series allocation within the MD110 defines the structure or framework for all number analysis and call routing performed by the Jessica/MD110. Number allocation within the MD110 can be described as specification of the leading digit or pre-digits to be used (or reserved) for a given function by the MD110. A minimum number of digits must be specified such that the pre-digits uniquely define the set of numbers or number series to be used for the intended function. The pre-digits defined for each function may not overlap or conflict with the pre-digits used for any other function.

To properly configure the MD110 for the desired Jessica/MD110 operation, numbering plan information must be defined for any of the following functions which apply. The general MD110 configuration data file provided by EGE defines a “standard” numbering plan which may be used. This numbering plan, however, may not be acceptable for all applications. For each of the following functions which apply to the intended Jessica/MD110 application, provide the numbering plan information indicated. Information pertaining to the “standard” numbering plan and other numbering restrictions are noted.

1. Which number series (unique pre-digit(s)) will be used for making inbound EDACS radio calls?

   [The standard numbering plan uses the pre-digits 0-3 for making inbound EDACS radio calls (leading dialed digits 0, 1, 2, or 3). “0” and “1” are the leading dialed digits for a 5-digit radio LID individual call. “2” is the group call indicator number, and precedes a 4-digit GID when making a radio group call (“2” + 4-digit GID). “3” is the digital call indicator number, and precedes a 5-digit radio LID when making an individual digital call (“3” + 5-digit LID). “3” precedes the group call indicator number and 4-digit GID when making a group digital call (“3” + “2” + 4-digit GID).]

   It is possible to specify an additional EDACS call selector number to be used as the leading digit(s) of the number series for making inbound EDACS radio calls. An example of this is using the number “7” as the EDACS call selector. The pre-digits used for making inbound EDACS radio calls would then be 70-73 (leading dialed digits 70, 71, 72, or 73). In this example “7” would be the EDACS call selector number, and would precede the digits 0-3 for making EDACS radio individual, group, or digital calls as described above.]

   ____

2. Which number series (unique range of numbers, typically 4 digits in length) will be used for MD110 test extensions?

   [The standard numbering plan reserves the number series 4000-4099 for MD110 test extensions.]

   ____

3. Which number series (unique pre-digit(s)) will be used to call the public network (PSTN)?

   [The standard numbering plan uses the number “9” as the pre-digit for dialing the public network. See Least Cost Routing, item 7 below.]

   ____

4. Which number series (unique pre-digit(s)) will be used to call another PBX/private network?

[Not applicable for standard configuration. If the MD110 is connected to another PBX, “8” is the suggested pre-digit for dialing the PBX/private network.]

____

5. Which number series (unique number or range of numbers, typically 4 digits) will be used for DISA (Direct Inward System Access)?

[The standard numbering plan uses the number “5000” as the DISA number.]

____

- If authorization codes are required for DISA (no EZDISA patch), then a listing of the codes (maximum length of 7 digits, cannot begin with 0) and the associated call discrimination class (0-14), if required, will need to be provided.

6. Which number series (unique range of numbers) will be used for any abbreviated dialing?

[The standard numbering plan reserves the number series 4100-4999 for common abbreviated dialing.]

____

- If abbreviated dialing is used, provide a listing of the abbreviated numbers to be dialed and the associated dial code and abbreviated dialing class (0-3).

7. Is routing out an MD110 trunk based upon the originating site required? ____________

- If so, this requires additional non-trivial programming. Please provide an example of the routing requested, e.g., site 1 out of trunk B.

8. Are telephone digits to be passed from the MD110 to the PI for the purpose of logging? ____________

[Please note that the MD110 can only pass phone digits if they are received from the outside PSTN/PBX.]

9. Is Least-Cost Routing (LCR) required in routing outgoing calls from the MD110? ____________

- If required, which number series (unique pre-digit(s)) will be used for LCR?

[The standard numbering plan uses the number “9” as the LCR code for routing calls to the public network. Note that the number series used may be the same as that used to call the public network (see item 3 above) if LCR is to be used in selecting the route choice.]

____

10. Is toll call discrimination required in routing outgoing calls from the MD110? ____________

[The standard configuration defines no toll call discrimination. Note that if toll call restriction is to be performed by the MD110 in routing outbound EDACS radio calls, then the same restriction must apply for all radio LIDs.]

- If required, indicate the area codes and/or office codes to be denied by call discrimination class (0-14). Copies of the attached LCR form may be used to provide this information.

LEAST-COST ROUTING

Least-Cost Routing is a function provided by the MD110 whose primary purpose is to automatically route outgoing calls over the most economical trunk route available. To do this, it analyzes the dialed number to determine the call's destination and proceeds to the available route choices for that particular destination. The route choices are arranged in the LCR database in ascending order of cost so that the first choice reached is the least-cost route for that destination. If the least-cost route has a trunk available, the trunk is selected and the call completed. If not, the system may move on to the next available choice. Least-Cost Routing can also be used to perform dialed number modification such as pre-digit number truncation or insertion, and can provide toll call restriction.

Least-Cost Routing is typically only appropriate if more than one trunk route choice exists for routing outbound calls. If Least-Cost Routing is required, provide the following information.

Specify all Long Distance Carriers being used.

Carrier Name	Dedicated or with Local Trunks	Do They Require "1" ?
______________________	______________	________
______________________	______________	________
______________________	______________	________

For any of the following call types, indicate as many trunk choices as available or to be used. Indicate NA if a call type is not allowed.

A) Which trunks should be used for local 7-digit calls, 800 No. calls, and 900 No. calls? Indicate local Area Code.

Local 7-digit

1st Choice: ______________________

2nd Choice: ______________________

800	900
1st Choice: ______________________	1st Choice: ______________________
2nd Choice: ______________________	2nd Choice: ______________________

B) Which trunks should be used for toll or 1 + 7-digit calls in the local Area Code? Is 1 + 7-digit calling used? __________

1st Choice: ______________________

2nd Choice: ______________________

C) Which trunks should be used for external "0" (operator) calls?

1st Choice: ______________________

2nd Choice: ______________________

D) Which trunks should be used for other in-state Area Codes? Indicate Area Codes.

1st Choice: ___________________________

2nd Choice: ___________________________

E) Which trunks should be used for all other Area Code calls?

1st Choice: ___________________________

2nd Choice: ___________________________

Are Alaska, Hawaii, Puerto Rico and other islands (AC 809), and Canada calls excluded from any of these routes?

If so, which ones? ____

F) Which trunks should be used for International Calling (other than Area Code calls)?

1st Choice: ___________________________

2nd Choice: ___________________________

G) Which trunks should be used for Information Calls?

411	555-1212, AC + 555-1212
1st Choice: ___________________________	1st Choice: ___________________________
2nd Choice: ___________________________	2nd Choice: ___________________________

H) Which trunks should be used for Equal Access Calls (10XXX)?

1st Choice: ___________________________

2nd Choice: ___________________________

I) How should "911" be treated (routed internally to an extension number, or externally)?

____

If TIE lines are used to interconnect to another switching system, should these lines be used in Least-Cost Routing for the area served by the outbound terminating end? If so, what calls should be routed over these TIE lines? Provide a list of the area and local office codes, and the outgoing access code for the far end system(s), if applicable. Copies of the attached LCR form may be used to provide this information.

MD110 LCR INFORMATION

Use a separate sheet for 7 digits, 1+7 digits SHEET NO.: ___ OF ___

AREA CODE: ________________ ROUTE/TRUNK: ________________

OFFICE CODES: PRE-DIGITS: ________________

200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295
201 206 211 216 221 226 231 236 241 246 251 256 261 266 271 276 281 286 291 296
202 207 212 217 222 227 232 237 242 247 252 257 262 267 272 277 282 287 292 297
203 208 213 218 223 228 233 238 243 248 253 258 263 268 273 278 283 288 293 298
204 209 214 219 224 229 234 239 244 249 254 259 264 269 274 279 284 289 294 299

300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395
301 306 311 316 321 326 331 336 341 346 351 356 361 366 371 376 381 386 391 396
302 307 312 317 322 327 332 337 342 347 352 357 362 367 372 377 382 387 392 397
303 308 313 318 323 328 333 338 343 348 353 358 363 368 373 378 383 388 393 398
304 309 314 319 324 329 334 339 344 349 354 359 364 369 374 379 384 389 394 399

400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495
401 406 411 416 421 426 431 436 441 446 451 456 461 466 471 476 481 486 491 496
402 407 412 417 422 427 432 437 442 447 452 457 462 467 472 477 482 487 492 497
403 408 413 418 423 428 433 438 443 448 453 458 463 468 473 478 483 488 493 498
404 409 414 419 424 429 434 439 444 449 454 459 464 469 474 479 484 489 494 499

500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595
501 506 511 516 521 526 531 536 541 546 551 556 561 566 571 576 581 586 591 596
502 507 512 517 522 527 532 537 542 547 552 557 562 567 572 577 582 587 592 597
503 508 513 518 523 528 533 538 543 548 553 558 563 568 573 578 583 588 593 598
504 509 514 519 524 529 534 539 544 549 554 559 564 569 574 579 584 589 594 599

600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695
601 606 611 616 621 626 631 636 641 646 651 656 661 666 671 676 681 686 691 696
602 607 612 617 622 627 632 637 642 647 652 657 662 667 672 677 682 687 692 697
603 608 613 618 623 628 633 638 643 648 653 658 663 668 673 678 683 688 693 698
604 609 614 619 624 629 634 639 644 649 654 659 664 669 674 679 684 689 694 699

700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795
701 706 711 716 721 726 731 736 741 746 751 756 761 766 771 776 781 786 791 796
702 707 712 717 722 727 732 737 742 747 752 757 762 767 772 777 782 787 792 797
703 708 713 718 723 728 733 738 743 748 753 758 763 768 773 778 783 788 793 798
704 709 714 719 724 729 734 739 744 749 754 759 764 769 774 779 784 789 794 799

800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895
801 806 811 816 821 826 831 836 841 846 851 856 861 866 871 876 881 886 891 896
802 807 812 817 822 827 832 837 842 847 852 857 862 867 872 877 882 887 892 897
803 808 813 818 823 828 833 838 843 848 853 858 863 868 873 878 883 888 893 898
804 809 814 819 824 829 834 839 844 849 854 859 864 869 874 879 884 889 894 899

900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995
901 906 911 916 921 926 931 936 941 946 951 956 961 966 971 976 981 986 991 996
902 907 912 917 922 927 932 937 942 947 952 957 962 967 972 977 982 987 992 997
903 908 913 918 923 928 933 938 943 948 953 958 963 968 973 978 983 988 993 998
904 909 914 919 924 929 934 939 944 949 954 959 964 969 974 979 984 989 994 999

JESSICA MD110 TRUNK LINE CONNECTIONS AND CHARACTERISTICS

CUSTOMER NAME: ______________________________ SHEET NO.:_____ OF_____

CONTACT: ____________________ PHONE NO.: ____________

INSTALLATION ADDRESS: ______________________________

____

____

TRUNK TYPE (ANALOG or DIGITAL): ____________________ EXTERNAL INTERFACE (PSTN or PBX): ____________

TRUNK TEL NO. or CKT ID/ACCESS CODE or CKT ID/CHAN NO.	INC, OUT, BWT, DID, or TIE	GROUND, LOOP, WINK, TONE, etc.	HUNTING SEQUENCE NO. (if app)	TERMINATING LOCATION*	OTHER DESCRIPTION

* For Incoming (INC) or Bothway (BWT) CO trunks: indicate DISA, Operator Console, Extension, or Hunt Group Number

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